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JULY
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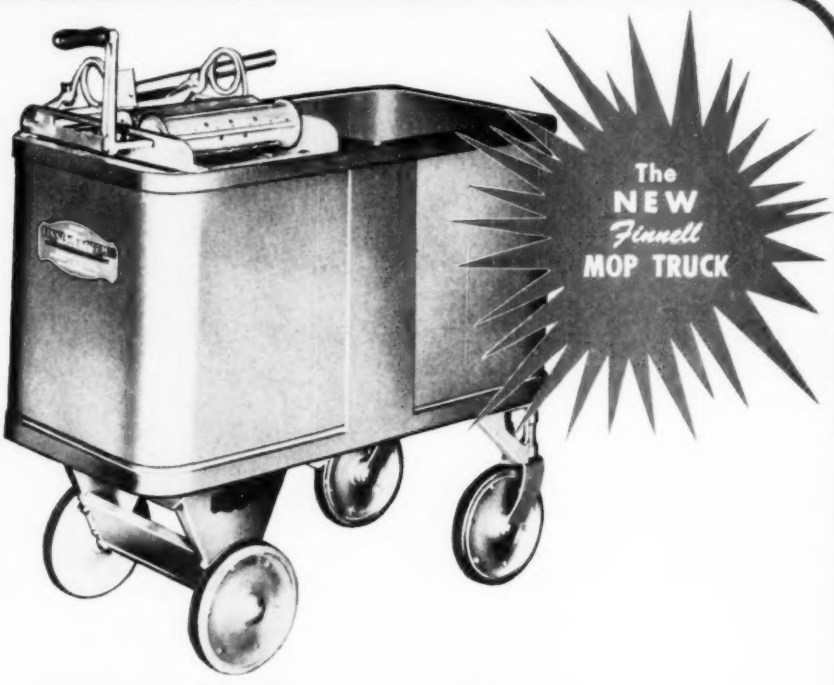

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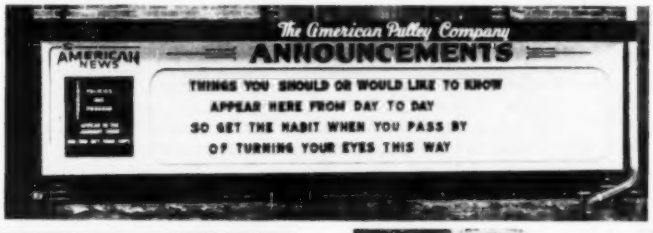
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JULY **1949**

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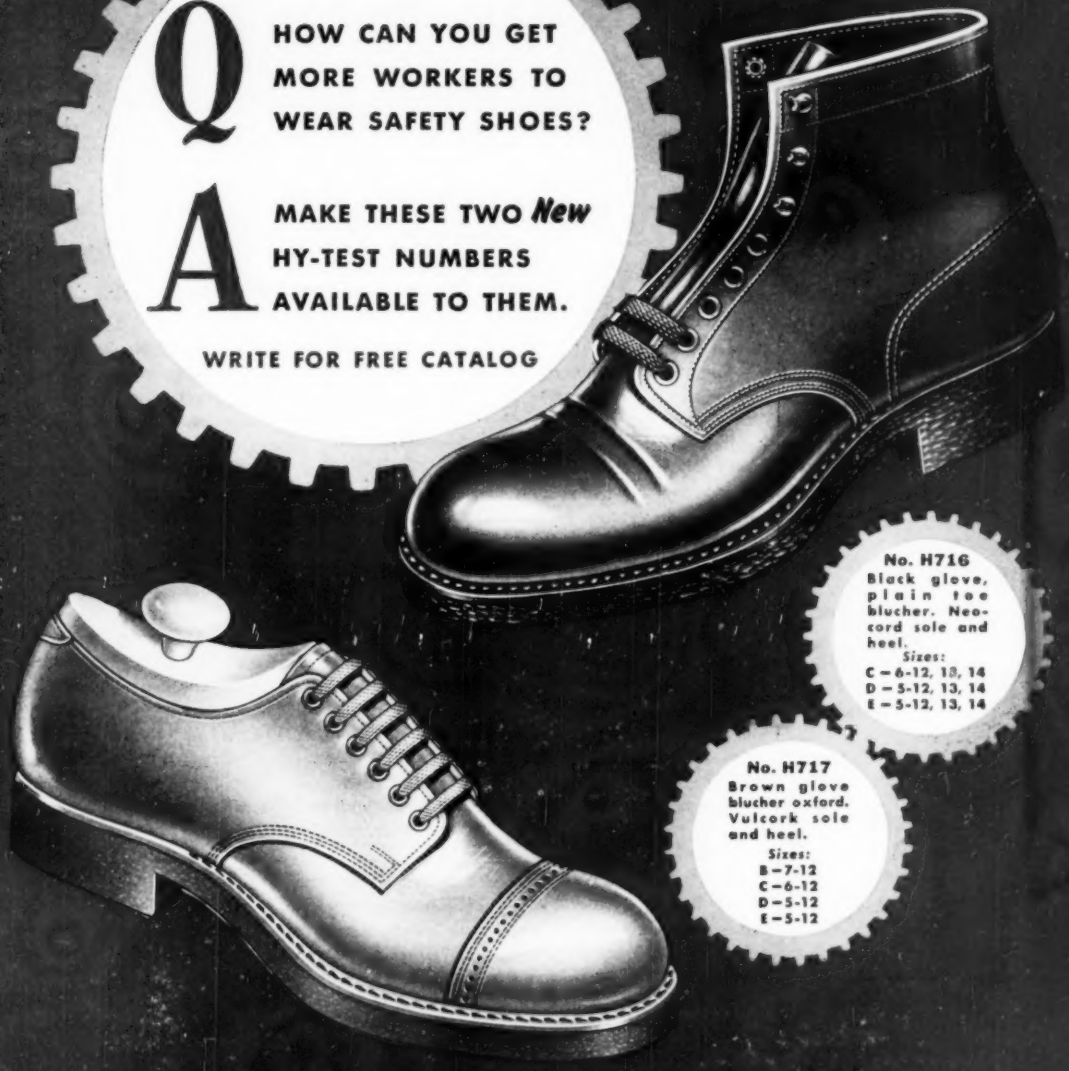

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It's Safe to Say

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★ SAFETY AND DEMOCRACY

SOME self-important little man in the Kremlin has decreed that there is no such thing as heredity. We wonder if this communist theorizer fully understood what he was doing when he exiled heredity to the particular Siberia where bourgeois sentimentalities go. A world without heredity offers some startling possibilities. We are used to seeing dictator states trying to make the people's minds conform to the opinions of a few black shirts, brown shirts or red shirts. Control of thought will be nothing new; but with heredity gone, it should be possible in a few years to produce a citizenry that would be red-skinned as well as red-minded! Undoubtedly it is rushing things a little to expect all communists to have red skins by next May day, but perhaps by the end of this five-year plan or the next one there will be a technicolor display of red skins in the Red Square. We can visualize it now: all those shining red faces beneath the waving red banners, the strong red voices chanting the shining red slogans. It will be a hell of a show. Incidentally, when and if the day comes when red countries have red-skinned people, we will back any petition by American Indians requesting that they no longer be referred to as "red skins."

This may be a round-about way of approaching the subject of industrial safety, but in our cold war for men's minds and loyalties, industrial safety is a pertinent factor and even a weapon. President Truman's famous "Point Four" for technical assistance to underprivileged areas of the world is attracting more and more attention. It is our belief that safety must be an integral part of this scientific and economic aid, for by bringing safe industrial improvement to other areas we are at the same time furthering the cause of democracy.

The concept of safety is based on the dignity and worth of the individual, and is, therefore, closer to democratic ideals than it is to the ideology of an all-powerful state. Our form of government, with its checks and balances and with the Bill of Rights written into the Constitution by popular request, is designed to protect the inherent rights and welfare of the individual and to make the government the servant of the people. Similarly, industrial safety has as its goals the prevention of accidents which might happen and the protection of the individual's physical well-being in order that he can be the master of the machine. Ultimately, industrial safety makes the individual the master and not the slave of his standard of living.

In totalitarian states, however, the worker remains the slave of the standard of living, and is even likely to be destroyed by attempts to raise that standard. Can the industrial safety of an individual be important in a land where groups can be purged because of political or religious beliefs, where slave-labor conditions are countenanced, where the individual becomes an identity card, where employment can become a matter of government dictation? It is difficult for us to picture safety surviving in such an environment. Not only does individual welfare become non-existent, but initiative and efficiency become warped and frustrated.

Frankly, we prefer a way of life in which the individual has an opportunity for growth and development, where industry and government recognize the welfare and rights of the worker and voter, where the protection of the individual is more important than the amount of "power" which the industrial or governmental management can wield. Communists can have their unadulterated "environment." We will take a philosophy that gives to each person his "inalienable right" to life, liberty and the pursuit of happiness.

We also hope that, in giving technical aid to backward areas, we will try to teach them the "safe" way. For by showing underprivileged peoples that their personal welfare is just as important as their economic advancement, we will be giving them a fundamental lesson in democracy.

R. P. E.

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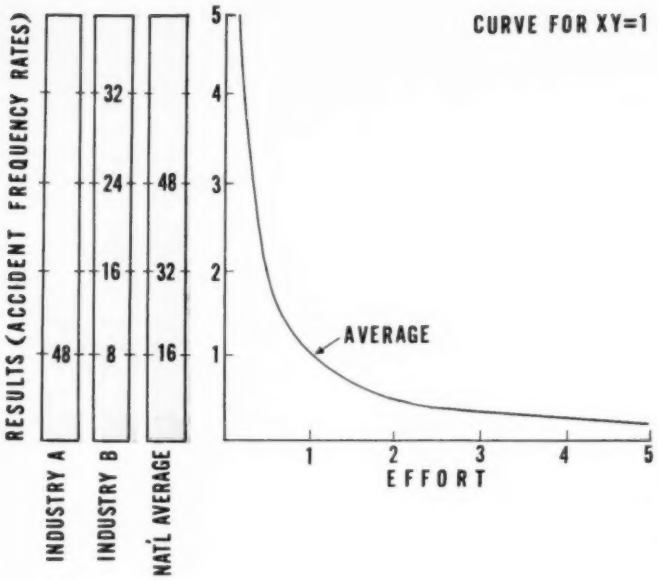


By EDWARD A. CLARK,
Safety Director,
Frankford Arsenal,
Philadelphia, Pa.

If you think statistics are just a convenient way of showing the accident record of a plant, see how they can be used as a dynamic force to improve safety.

SAFETY INVESTMENT VS SAFETY RETURNS

WHAT company would be so foolish as to hire a man to shovel its assets down a rat-hole? And what company would not logically spend $1.00 to save $10.00? As elemental as this sounds, many companies do not know they are spending too little on Safety.

Let us consider the possibility of using a formula to show executives where they stand. The answer would be easy if it were merely a matter of showing that output is in direct relationship to input. For example, if 60 pieces of material were stamped out in a press in one minute, 600 could be expected in 10 minutes.

Such a simple relationship does not exist in most business activities. There is what is known as a law of diminishing returns, for instance. Similarly in Safety it is obvious that results are not directly proportionate to effort or investment expended. With a very little effort a bad record will improve; it takes a lot of effort to further improve a good record. However, with the right program, we should be able to make the results come out as we want them. Theoretically, we know that *all* accidents, fires and occupational ill health, can be prevented. The law of cause and effect governs here, as elsewhere; and if we know the results desired, we can tell the effort-investment required. To achieve perfection, however, demands an investment which is impractical. Contrariwise, if a company does not care what its record is, no effort toward a sound Safety Program is wanted.

Formula for Safety

All this might be shown by the formula $XY = 1$. The accompanying chart shows how the curve of this formula looks. Figures shown on the ordinate indicate results wanted—usually noted by the commonly accepted index of "Frequency." Whether such an index is as valuable as believed is beyond the scope of this article, and has been covered by other writers. As management seems to be still sold on such an index and as we need to start from a few assumptions, it will serve as a basis for this discussion. The numbers 1, 2, 3, 4 are used for plotting the curve. Translated into frequency, 1 indicates the norm of Average Standard Frequency Records throughout the country—about 16. 2 would mean 32 and 3, 48. Optional choices are also indicated in place of 16, and explained below.

On the abscissa of this graph we mark off "effort." Right here it must be recognized that it would take a philosopher-engineer to answer the question of "What constitutes a unit of effort?" For

many years this has been a subject of discussion, and it is believed, one which was recently considered by the technocrats. It certainly is not a matter of muscle, or of nervous activity, or pure knowledge, or any measurable thing or quality. Therefore, it will have to be left up to each manager and Safety Director to know the proper "unit" of safety effort for his particular plant. With experience, and conscientious evaluation of the effective use of available safety techniques, this unit can be developed. Suffice it to say here, however, that there is no industry or plant where this cannot be shown. And one can determine in advance the requisite additional activities for any plant in question.

Meaning of the Chart

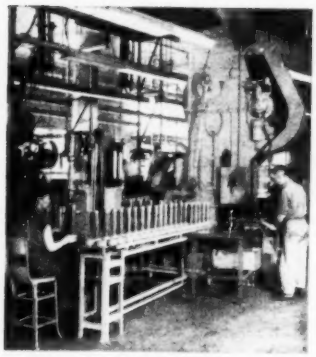
It will be recognized that this curve never touches zero, no matter how far it may go in either direction. This is very interesting, as we know that in order to maintain a frequency of zero in our accident record almost infinite effort would be essential—(which would be the interception of the Almighty, some might say). Not only is this extreme clearly indicated by this curve, but also the other extreme is graphic in the implication that with no efforts on anyone's part, the frequency could be catastrophic—say, for instance, all men on the job killed after one minute's work.

Now between these two extremes is the usable range, as only the center of the curve has practical application. Let us select the center, or the point where a unit of effort produces a unit of result. Let us call this point the national average of all frequencies, as noted above. This indicates that with an average amount of work or energy the country achieved an average result. If we desired to improve the record by cutting down the frequency one half (to eight), the curve indicates that we would have to double our efforts (two units). Likewise, were we to relax our efforts one half of the average, our frequency might shoot up to thirty-two.

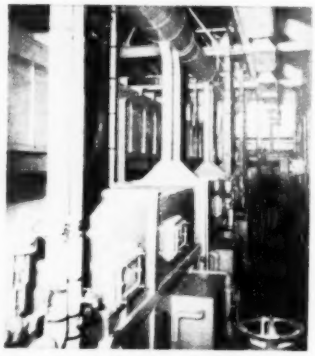
This, then, is the basic curve for a composite of all industries which contribute to the national average of all frequencies. Now let us examine more closely a particular activity. If we are engaged in mining, for instance, we do not expect to equal the safety record of the automobile industry. The first of these has a national frequency about three times the average of the sixteen mentioned, and the latter has a national frequency of about one half of this sixteen average. Clearly, marking these on the above curve would not carry significance of greatest value to management. Hence, new curves of similar characteristics are needed. This is easily accomplished by substituting new ordinate figures for frequency; all else in the chart remaining the same. For industry "A" forty-eight would be in place of sixteen, and for the industry "B" eight would be substituted, etc.

For those who contend, with some reason, that it may take twice the safety effort in some particular activity to obtain the results considered average for their industry (explosives, for instance), we can change the figures in the chart, or else we change the formulas and

Safety Problems at the Frankford Arsenal

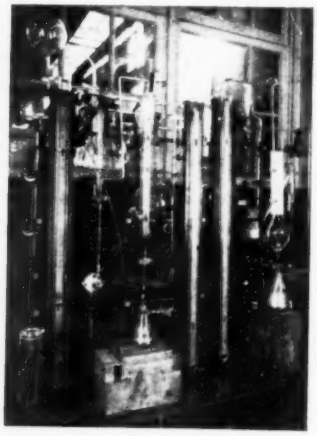


Pilot lines by the score introduce an almost infinite number of challenging safety problems.



Totally enclosed conveyor belt in toxic atmospheres for efficiency and health of workers.

Cold room testing of weapons poses many new questions concerning welfare of experimenters.



Explosives research raises safety problems. Here, apparatus for measuring surface area of powders.

the resulting curves. It can readily be seen that any industry can select its own particular curve, by simply knowing the average frequency rate assigned to that type of industry. For instance, the auto industry's national average of 8.0 would indicate that we divide eight by sixteen and get 0.5; the formula would be $XY = 0.5$ instead of $XY = 1$.

Evaluating Safety Effort

The development of such a formula would seem to provide an approach to scientific means for determining the effectiveness of safety efforts expended in any given industry. It should also enable management to gauge the effectiveness of its Safety Program, to see if it needs a transfusion.

As a matter of fact this scientific approach to accident prevention has already been applied successfully at the Frankford Arsenal. Here we reduced the accident frequency about 75% (roughly from 16 to 4). By "accidents" we mean not only the disabling or lost-time cases, but also first aid injuries, property damage, fires, and industrial ill-health. Cost? With an investment of about $45,000 per year, we are saving around $500,000 yearly.

But let us have a flashback to the beginning and see how to apply the formula for practical results. The initial requirement for any plant seems to be to make a preliminary physical inspection of all structures, equipment and processes. This is much more important than any desk work in reviewing statistics. Frequently, an experienced engineer can see conditions or practices which are so bad that he is surprised that even more accidents or fires are not recorded in the office files. After this sizing up, he might then assign a classification compared to similar exposures in the national picture.

For instance, by looking through the National Safety Council's "Accident Facts" for 1947, page 24, we note that were an industry devoted to warehousing only, the national average frequency experience would run about 26, and if to chemicals, 10. However, here at Frankford Arsenal we have not only these two, but many others—some of which are listed in the digest, while many others are peculiar to special activities here, such as research, development and testing of new weapons. It is noted in that digest that the average frequency for all industries reporting was around 14. Because more activities here fall on the lower half of that chart (such as wood working, foundry, construction, etc.), it seems fair to use a round figure of 16 as an index of the average frequency experience for comparable exposures throughout the country. Who would, however, be satisfied with just an average? We should be able to cut it in half; and with this target frequency of 8 as the first goal, we approached the program.

First Phase of Improvement

The curve indicates that we were getting an average result for an average effort, or one unit of effort giving one unit of result which is shown equal to a frequency of 16.0 on the graph. To bring this down to a frequency of 8.0 required two units of effort. Based upon experience and preliminary inspection of the exposures, it was decided that this additional effort should be composed as follows:

a. Obtain increased backing and interest of top management. Make this continuous, active, constructive, and publicize it. Report direct to them.

b. Set up a centralized safety organization with clearly defined responsibilities and adequately trained engineering personnel not the usual "Inspector" caliber.* Include a central Safety Board on which would sit representatives from all departments and management. Establish foremen safety committees within each department and see that monthly meetings are held conference style.

c. Develop a set of standards, procedures and regulations for supervisors—not employees. These to be specific and technical, and avoid attempts toward wordiness or generalities which would not help the foreman or supervisor on the job. There are many things wrong with the usual booklet of "Safety Rules."

This plan apparently worked, as the frequency was driven down to 8.0 as desired and the attendant economies were, similarly, highly satisfactory.

Second Phase of Improvement

Again referring to the graph or formula, we note that one additional unit of effort might bring the frequency to 5.3. Encouraged by the first results, we decided to try for this new goal. Based upon experienced judgment, the following were the selected items which comprised this additional unit of effort:

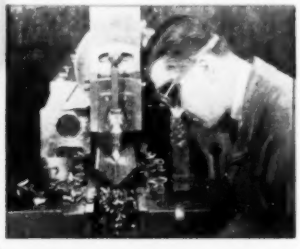
a. A minute inspection of every inch of the plant including all 150 buildings and their equipment. Submit constructive recommendations, and follow up. Provide engineering alternates where helpful, and see that no interference with production will result from following out these recommendations. (In most cases production and efficiency were simultaneously aided.) A periodic inspection program was then set up covering specified equipment and structures.

b. Accident analyses and reports, need little clarification as this is self-explanatory and has been thoroughly *(To page 40)*

*The caliber of safety men is important. They should know the field they are talking about. A Mechanical Safety Engineer is best qualified to cover safety aspects of pressure vessels, elevators, etc., while a Civil Safety Engineer should cover the various aspects of building construction and maintenance, and a Chemical Safety Engineer—the manufacture of explosives and use of hazardous chemicals.

Scenes From Five SAFETY MOVIES

Pictures, from top to bottom, by courtesy of National Fire Board of Canada; U. S. Public Health Service; U. S. Navy; U. S. Office of Education; U. S. Navy.



Movies Can

By W. SHERMAN GREENE, JR.,
Castle Films Division of United World Films, Inc., New York

To SELL safety, you have to SHOW them safety; and teaching by means of training films is one of the most effective and efficient ways of providing mass safety education.

TODAY, wherever you go the green light of Safety is *seen* before your eyes. In books, magazines, playgrounds, highway billboards, trains, subways and boats—everywhere. Schools, industry and business houses are constantly *showing* us how we can do things more safely.

The war years taught that, by showing rather than telling, men of the Army and Navy could learn more quickly and retain knowledge longer, and this experience stimulated the greater use of sound motion pictures in schools, industry and churches.

However, while everyone knows that "Seeing is Believing," hundreds of fine sound films, teaching many safety lessons, are still not as widely known and used as they should be.

Industrial Safety Films

Let's look at a few of the subjects now available. We can see (and hear) how all kinds of machines in industry are operated—not only efficiently but also safely. The safe way to operate and maintain farm equipment, our automobiles, buses, and trucks is also shown in films. The titles tell the story:

THE TURRET LATHE—AN INTRODUCTION, YOUR DRIVING HABITS, THE OPERATOR AND SAFETY—BUSES, SAWING TEMPLATE METAL, HORSESHOEING, RECONDITIONING A MOWER.

Then there are specific SAFETY pictures showing how measures are applied and followed, in any and all types of industrial plants, to protect workers:

SAFETY IN THE SHOP, SHOP SAFETY, TO LIVE IN DARKNESS.

All of the foregoing titles are U. S. Government 16mm sound motion pictures, prepared for the specific purposes indicated.

The National Film Board of Canada has started a series of fine films, entitled ACCIDENTS DON'T HAPPEN, which covers industrial plants—showing how to eliminate general carelessness and avoid accidents.

Akin to these are films on highway and traffic safety, not only in the operation and maintenance of the vehicles as above stated, but also expressly related to safety measures on the roads:

DANGER IS YOUR COMPANION, TRAFFIC WITH THE DEVIL, WE DRIVERS.

Then we can go into the home

Show Them the Safe Way

and office and apply the same lessons:

SAFETY IN OFFICES, SAFETY AT HOME.

Fire Protection Films

All kinds of accidents are covered in detail, with a special emphasis on fire prevention and fire control after there is a fire. These show methods, equipment, and personnel work, and are often as entertaining as they are instructive, as they have been prepared in a very careful manner. These are some of the titles:

THEN IT HAPPENED, FIGHTING LARGE FIRES IN BRUSH AND GRASS, PREVENT FOREST FIRES, WORST OF FARM DISASTERS.

First Aid and Hygiene Films

And, of course, after the event has occurred, the many films on first aid treatment and rehabilitation—all are "safety" films:

SHOCK, COMMON EMERGENCIES, MINOR INJURIES, BURNS, FRACTURES, POISON, ESSENTIALS OF FIRST AID.

In the same category are the films on preventive medicine in the home, in the office, and in industry:

TECHNIQUES OF GROUP CHEST X-RAY SERVICES, CHOOSE TO LIVE, THREE COUNTIES AGAINST SYPHILIS.

Films may be obtained on all methods of sanitation in restaurants and elsewhere—including the farm and the dairy. While these are all preventive in nature, they definitely teach safety—safety for the producer and the consumer.

Films on personal life, hygiene, appearance and even courtesy to others are safety films in the broad sense, not to mention nutrition and diet, as well as medical films highly specialized for professional use. Many of these pictures are in color and combine entertainment with teaching:

MAGIC IN THE KITCHEN, THE BALANCED WAY.

And finally the American Red Cross has made available a long series of films showing their work, taking care of the injured after the accident—safety perhaps too late, but also in many ways preventive:

A LIFE IN YOUR HANDS—showing how blood saves lives; DISASTER STRIKES, and RED CROSS NEWSREELS.

In any discussion of these motion pictures, especially when we are using them to teach safety, it should be emphasized that all of these films are 16mm in width with sound, and that they are completely safe to use and to project. The film is safety film.

Uses of Films

With the great number of subjects available, it must be clear that they may be used in many different ways. Schools, colleges, and industry and business today regularly show them as part of scheduled programs and courses, where training in various vocations is desired or as a specific course on safety.

Factory or office classes may also use these films at regular intervals or as part of noon-day rest period entertainment programs. Safety films would fit in well with a short cartoon or entertainment subject.

The number of uses and methods is so great that specific suggestions can only be hinted at. Each user readily can determine the most effective use of these aids.

Anyone who has ever used a film will realize that each one must be previewed by the teacher beforehand so that he may clearly explain what to look for, prior to showing the picture, and may fully discuss it afterwards. Questions should be prepared to bring out points to be noted and there should be a complete follow-up, perhaps with a second showing of the picture.

Still Films

Quite frequently the 35mm nonmotion filmstrip is used after the motion picture has been shown. Most of these are silent, but they are especially useful in that the image may be left on the screen for a long period and specific subjects discussed. In addition, they often cost as low as a dollar each. Many of them are made from the motion picture of the same title, and are supplied with guides explaining the subject matter.

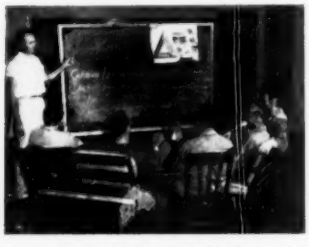
Today both 16mm motion picture and 35mm filmstrip projection equipment is available in quantity, most of it more reasonable than in recent years. Industry has not found it at all difficult to acquire the projectors it needs and operators are easily trained. In many communities, church and school equipment may be obtained at little or no cost and *(To page 32)*

FEATURE

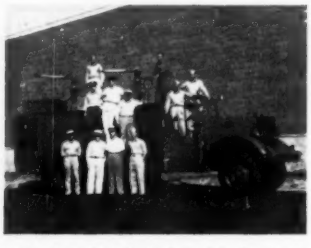
This is the first of three feature articles concerned with Educational Aids to Safety. The next two articles of the series will be published in the August and September issues of SAFETY ENGINEERING.

Demonstrating rescue techniques in the fireman training class at Tyndall, a "rescue" is made from the burning training building. Fireman at left uses an extension on his hose to get water where needed.

Fire Chief Biggs demonstrates use of pike pole in providing greater ventilation under simulated fire conditions to a group of Tyndall Air Force Base personnel being trained in fire fighting.



Fireman Crew Chief Martin E. Waldorff points out to the fire fighters training class that fire is based on a triangle made of three elements and that removal of any one will extinguish it.



Heads of the Tyndall Air Force Base fire department. lower left, Ass't Fire Chiefs Dry and Hunter, Fire Chief Biggs and Major Stehling, Air Base Fire Marshal. Note fog guns on fire truck.

How an air force base has successfully taught its personnel the methods of fire fighting and has brought fire safety to the surrounding community.

PREVENTION of fire through constant emphasis upon safety precautions, coupled with intensively trained fire fighters whose knowledge is increased through regular training periods, has resulted in a record of no loss of life due to fire, and no major fire losses at Tyndall Air Force Base for the last three years, during which time Mr. H. F. Biggs has been Fire Chief.

The policy, consistently maintained over this long period, has been to enforce a system of regularly scheduled fire-prevention inspections in order to reduce or eliminate fire hazards. Always, Chief Biggs emphasizes, the primary mission of fire fighters is protection of life. Protection of property, while vitally important, is secondary. Enforcement of these policies is maintained by Major H. J. Stehling, Air Installations Officer, and also Air Base Fire Marshal.

In addition to these credos of the successful fire department, a training program for use of hand-operated fire extinguishers is constantly maintained throughout the base. Personnel are educated in the use of extinguishing equipment and in the attendant dangers when fighting fires.

Three fire stations are on the Panama City, Florida, base. One, on the flight line, is known as the crash alert station. Equipment for rescue of personnel and extinguishment of aircraft fires is maintained on constant alert. Aircraft are kept under continual surveillance from a watch tower located on top of the crash alert station, insuring quick detection of aircraft which may be in trouble. Crash fire

Training Airmen to Fight Fires

trucks are equipped with a special radio for monitoring aircraft and ready communication in case of emergency. If an aircraft spots a forest or brush fire, it is reported to the control tower, which in turn alerts the fire department.

The main fire station is centrally located for protection of the hangar and warehouse areas. Also, it is close enough to the flight line to assist the alert crews there. Nerve center of the fire-fighting complex at Tyndall, this station is equipped to handle any type of fire or rescue emergency on or near the base.

The third station, located on the administrative side of the field, protects hospital, messhalls, administrative sections, Air Tactical School, other school installations, and family type quarters located in the area. In addition to constant vigil over life and property afforded by these stations, hand fire extinguishers and other first aid fire appliances are installed in all buildings, utilities and systems.

Fighting Off-base Fires

Tyndall's firemen cooperate with the Florida State Forest Rangers in extinguishing forest and brush fires. This type of fire happens more frequently than all others put together and is nearly always caused by electrical storms. Tyndall's firemen have fought and successfully extinguished two fires at a time within a five mile radius of the Air Base.

Since fire engines cannot generally be used because of the sand or muck terrain, Air Installations is immediately notified and fire plows towed by bulldozers or caterpillar tractors are dispatched to the emergency on flatbed semi-trailers. The flatbeds follow the fire trucks down roads as near as possible to the brush or forest inferno where the "dozers" and "cats" are unloaded. Lumbering to the scene they push or pull blades or plows, depending on circumstances, circling the area with a wall of bare earth inside of which the fire harmlessly burns itself out. If possible, a brush truck carrying a 300-gallon water supply, and equipped to draw water from a nearby creek or river, follows these earth moving giants, to extinguish any spark which may jump the gap.

Training Courses

A great part of fire prevention success at Tyndall may be attributed to the firefighter basic training course which covers 150 hours of time and 25 major subjects. Most trainees complete this course in less than four months. After completing the course, airmen firefighters get about ten hours a week of advanced training on Saturdays and Sundays when flying is at a minimum. Simulated crash and structural fires are set and extinguished on unusable wooden buildings and obsolete planes from which everything of value has been stripped. Simulated rescues are performed under actual fire conditions.

Practical applications of many of the subjects taught these firemen are made in extinguishing a training fire on a burning plane. In general they use knowledge acquired in courses on the following subjects: Hose Evolutions; Fire Streams; Signals; Tools and Equipment; Fire Truck (pumper) Operations; Water Systems and Hydrants; Fire Alarm Systems and Telephone Locations; Ventilation Principles; First Aid and Rescue; Crash Truck Operation and Airplane Fire Fighting; Airplane Construction, Identification and Essential Knowledge; Rescue Procedures; Use of High Pressure Guns (Fog Nozzles); Fog and Applicators and last but not least, Use of Crash Rescue Equipment and Rescue Tools.

Crash Rescue Techniques

Using what is known as the "V" pattern in these training fires, three crash trucks approach to windward, terrain permitting, of the burning plane. They park in an area between wing tip and aileron tip, facing the passenger area of the plane.

These crash rescue trucks, equipped to operate either off their own water supply or nearby hydrants, use a water pressure of 600 pounds per square inch. A metering device and an injection system add the proper amount of foam to the water. Fog nozzles apply the mixture at tremendous pressure.

Dragging the hose line, bucking the backward pressure of the nozzle, two firemen clad in protective material known as bunker clothing use the fog nozzle in a sweeping motion, and move side by side against the flame.

Two others, called "back up men," carry their lines just in the rear of the "lead men," hold the pattern open and keep fire off these men.

Turrets mounted on the center truck spray foam and water on the fuselage, especially at points where personnel are likely to be congregated. This keeps the fuselage cool and extinguishes much of the fire around the body of the plane.

The third truck utilizes its equipment and personnel wherever possible to bring release from the intense heat and greater safety to plane occupants.

During this time rescue men, bathed by the foam spray, cut out the emergency panel by use of metal cutting rescue tools contained in a special kit equipped for this use. Using tools as needed, they slice through the plane's body, enter the burning *(To page 28)*

Clean-Up Rooms

There is no reason why industrial washrooms should look or smell like a pigsty. The health and morale of workers demand that facilities be kept sanitary and attractive.

FEATURE

This is the second of a consecutive series of five major articles dealing with Plant & Building Maintenance. The next three features of the series will appear in the August, September, and October issues of SAFETY ENGINEERING.

A well-maintained washroom is not only clean in looks and in fact, it is also provided with automatic deodorizing and soap dispensing facilities and offers employees clean towels.

VERY often management is exceedingly neglectful and passive in relation to the maintaining of proper washroom sanitation. From the standpoint of civil and community pride, healthful sanitation is essential for all industrial plants and buildings just as it is essential to the individual's home. Sickness and disease thrive and spread in crowded areas. Workers comfort and convenience should also motivate management towards cleanliness and adequate sanitary measures within their washrooms. Yet, in a recent survey, many of the industrial buildings investigated had faulty and disease-breeding traps, and amazingly few provided sanitary napkin vending machines and disposal receptacles for the women's washrooms.

The following paragraph was taken from "Sanitary Products, Their Manufacture, Testing and Use" by Leonard Schwarcz:

"For a germ-free cleanliness, disinfectants are of paramount importance. Their use has arrested pestilence; converted disease-ridden places into healthy, sanitary communities and has improved the well-being of humanity in every quarter of the globe. Civilized mankind generally attests to the value and efficiency of disinfectants by their constant use. Too often the wrong product is used or the correct product is employed in an incorrect manner."

Ordinary cleansing methods, despite their importance, are often insufficient to overcome the offensive and nauseating odors emanating from various sources in lavatories. There are certain odors that are produced by ordinary usage, but the worst are caused by improper flushing. If a toilet bowl or urinal is flushed too soon, as is often the case, it stands to reason that the traps, instead of preventing odors from getting into the room, will be producing and releasing foul odors all their own. Even over a comparatively short period of time, traps of toilet bowls and urinals collect certain salt and sugar secretions. This organic material forms a hard mass which, in time, may cause stoppage in the pipes and result in costly plumbing bills. This is also the cause of offensive odors and unpleasant conditions that surround so many washrooms. An efficient method of removing such unsatisfactory conditions is to eliminate the *cause* of such disagreeable odors. The traps should be thoroughly cleaned once a month to insure healthful and sanitary washrooms.

Automatic Deodorizing

Although a cleansing disinfectant with deodorizing properties should be used for daily cleaning, this type of deodorization is only temporary and its effect depends upon the thoroughness of the person handling the cleanser. It is also important to install a deodorizing method that is not only efficient, but also one that is *automatic*. A thorough method of deodoriza-

Should Be Clean

tion is the use of a drip machine. This method has a number of decided advantages over other means of deodorization. In the first place the drip fluid itself has an aromatic odor and as there are perforations in these machines around a wick, the air circulates constantly and the drip machine works in exactly the same manner as blocks or crystals and perfumes the air. In addition to perfuming the air, however, drops of this oily drip fluid are released automatically at regular intervals into the bowl or urinal, spreading on the surface of the water, and acting as a deodorizer at the source of the odor. This method is one of prevention rather than camouflage. These aromatic drip fluids have no harmful effects on pipes and, in fact, help to prevent clogging.

The West Disinfecting Company offers a Coast-to-Coast washroom service, as do many of the other leading organizations in the sanitation field. Trained service men, experienced in using the proper products in the most efficient manner, visit installations on a regular periodic schedule to service deodorizing equipment and do special heavy duty cleaning of traps. This specialized service supplements the plant's own janitorial staff, and thereby relieves these employees for additional duties.

Plant Superintendents, Health Officials and others who wish to take advantage of this thorough cleaning service backed by years of practical experience, can assure themselves of maximum washroom sanitation and cleanliness at a minimum cost. Those who purchase service items, such as disinfectants, bowl cleaners, and deodorants are entitled to these special skills and services at no extra charge.

Disinfectants

For cleaning floors, walls and fixtures of washrooms a coal-tar disinfectant may be considered most satisfactory. These disinfectants designed for mopping, scrubbing and other general uses have the power to kill the germs of many communicable diseases in addition to cleaning and eliminating the need for soap. For mopping floors, solutions of one ounce of the proper coal-tar disinfectant to each gallon of water are highly effective. Floors should be cleaned in this manner just as often as they require such maintenance, which, of course, depends on the amount of traffic.

Occasionally it is more desirable to use a pine disinfectant in preference to the coal tar for cleaning floors, walls, fixtures, etc. of washrooms. As a class, pine disinfectants are just as effective as coal tars for cleaning and deodorizing. However, as disinfectants their effectivenes is limited because pine disinfectants are not effective against pus-forming organisms.

Washing Facilities

Dermatitis has been an occupational hazard since the Industrial Revolution. It is in management's best interests to select the hand cleaner which is designed to keep its dermatitis problem at a minimum. All plant and building washrooms should provide workers with the proper industrial hand soaps, either liquid or powdered which, in short order, pay for themselves simply by keeping workers on the job. It is certainly less expensive to provide workers with a satisfactory hand cleaner than to have them lose time because of irritated skin.

It stands to reason that the effectiveness of fine hand cleaners is greatly reduced when efficient dispensing equipment is not provided. Individual soap dispensers for liquid or powdered soaps or a pipe line system which feeds liquid soap from a single reservoir, dispensing it through individual valves over a basin, are considered most satisfactory and economical.

In addition to the above, washrooms should be equipped with towel facilities and disposal units which employees may use freely. By providing a comprehensive line of washroom supplies and equipment, as outlined above, management's responsibility to the sanitary conditions of employees' washrooms will be fulfilled. It should never be assumed that industrial washroom conditions need not be as fine as those found in the workers' own homes.

Pictures on page 16: top by courtesy of War Department, bottom by courtesy of West Disinfecting Company.

Free Bulletins & Catalogs are reviewed on page 64

Perhaps You Need

A CUSTOM-BUILT SAFETY

By EVERETT W. GRAHAM, Safety Director, Plastics Division, Monsanto Chemical Company, Springfield, Massachusetts.

To find the type of safety committee program that will work may require a lot of trials and errors: but it can be done, as the experiences of this chemical company show.

FOLLOWING the setting up of a full time Safety Department at the Plastics Division of Monsanto Chemical Company in 1941, the immediate problem arose as to the adequate organization of an accident prevention program. For several years prior to 1941, an approach to the safety problem had been made with the result that the plant, from a physical and mechanical standpoint, was in reasonably good shape.

Most reference material discussing methods of setting up an effective safety program recommend the use of safety committees. From the many types of safety committees described, it is quite apparent that there is no set pattern for organizing these committees which will work in every plant and for every industry. Some safety engineers feel that committees should be made up entirely from the nonsupervisory group; some feel that the committtees should be made up entirely from the supervisory group; and still others feel that the committees should be made up of personnel from various occupational levels.

Since 1941, we have made up committees of several types. Our experiences, both good and bad, in these efforts may be of interest to those who may now be facing the following question: "In the light of what I have read of the activities of safety committees, just how will I proceed in my own plant?" It is with this idea in mind that this story is presented.

I think we can all agree that committee work in any accident prevention program is one useful method of attempting to arouse interest and obtain realistic active participation in the program among plant personnel.

Departmental Committee Plan

Our first approach to this type of activity was to organize a system of departmental committees. Personnel of these committees were all from the hourly employee group. At least one man or woman was appointed from each operating department on each of the three shifts to serve as departmental safety representatives. The plant safety engineer was the chairman of this group. These departmental committeemen were to accompany the safety supervisor in his inspections of their respective work areas, take an active part in departmental safety meetings, assist fellow workers where necessary in presenting safety suggestions, and above all, set a good example by their personal attitudes toward accident prevention as expressed by their own actions in their own jobs.

Once monthly the entire group of departmental committeemen met with the safety supervisor to talk over their problems, action or lack of action on suggestions, and to discuss matters pertaining to the potential hazards of plant operations.

This organization was received with open arms by the employee group, for here was their opportunity to participate in the plant safety activities. This organization existed for about two years. During this period, one long range interdepartmental contest was in operation.

While this particular committee organization was new, there was considerable enthusiasm and interest; but even with rotating the membership every few months, the interest level in this type of activity seemed to wane rapidly.

The membership of the original committee was made up of carefully selected individuals which may account, in part, for the degree of enthusiasm when the group was first organized. Every three months, part of the group was replaced and it appeared as time went on that the quality of participation became less. This decreasing interest may have been caused partly by the type of individuals on the committee, but it was also a result in part of the lack of complete cooperation by members of supervision. Toward the latter part of this type of activity many of the committee members seemed to take the time spent in safety meetings, etc. as a welcome respite from their job rather than as an opportunity to help the safety program.

After about two years of this it became quite evident that interest and participation was at such a low ebb that some radical change was needed. As a result, this particular committee activity was allowed to lapse. There was no hue and cry

COMMITTEE PROGRAM

from either the employee group or from supervision. This reaction, or lack of it, in itself was final proof that the departmental type of safety activity had lost its value in our organization.

Supervisory Committee Plan

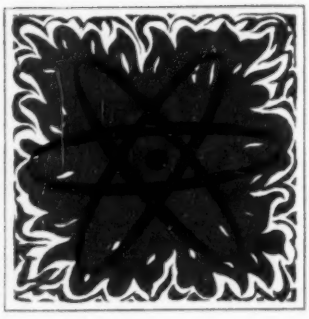
The failure of the employee committee organization seemed to highlight the fundamental idea that no safety program could prosper unless the supervisory group were wholeheartedly in back of the program. The question was then asked "Why shouldn't we have a series of committees made up entirely of supervision?" Therefore, after considerable discussion a series of committees was set up based on the overall plant line organization. At the top was the executive safety committee made up of members of top management, operating and staff groups. Its function was entirely that of setting safety policy as well as making decisions which management normally has to make with respect to expenditures and other major activities. Subordinate to this committee was a second line group made up of operating superintendents of the various divisions. This was actually the group which should spark the program. It was this group which was to indicate the type of program activity which should be established by the Safety Department and which activities were to be carried out by the next lower group of the committee organization. A third line of committees was made up of the first line supervision in each operating area with the operating superintendent as chairman. It was these departmental committees, made up entirely of supervision, who were actually to carry on the various types of program activities such as specific hazard surveys, obtaining suggestions from the employee, development of accident statistics within their respective areas, etc. Actually, this work was done by assigning projects to sub-committees of their own departmental personnel. With this particular setup the Safety Department acted entirely as a staff group providing assistance and accident data as needed or requested by the various committee members.

Once again the program started off with great enthusiasm. The only practice retained from the previous safety program was the monthly departmental safety meetings and the monthly supervisory safety meetings. Each of the new departmental committees, with the assistance of the Safety Department, outlined specific activities depending upon the particular conditions existing in the respective areas. Everyone seemed to work with a will and supervision took a new outlook toward safety activities; but as time went on there again seemed to be a gradual decrease in enthusiasm. Inasmuch as meetings of the various committees were held usually only on a monthly basis, there were many delays in getting decisions concerning issues which had to be submitted to higher echelon. These delays apparently *(To page 54)*

A special project committee at the Plastics Division of the Monsanto Chemical Company has prepared display of hand-tools and their dangers.

Another phase of the hand-tool safety drive was the display and award of useful tools to the employees having the best-maintained tool kits.

ATOMIC ENERGY AND



By

EDWARD J. KEHOE
Chief, Safety and Fire Protection Section
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U. S. Atomic Energy Commission

Should we fear radioactivity?
Do firemen need respiratory protection against uranium?
Why should water run-off be kept at a minimum?
What is a "pyrophoric" material?

THE phenomenon of nuclear fission was first confirmed in the United States in January 1939, slightly more than ten years ago. Tremendous developments have occurred since then and the extraordinary potentialities of atomic energy have both wartime and peacetime implications. My discussion is concerned with the industrial aspects of atomic energy, particularly as concerns fire protection and not with defensive measures against the fire effects of atomic bombing. Since the Atomic Energy Commission was established in 1946, our Safety and Fire Protection Branch has been faced with the task of servicing an entirely new field with many unique problems, an industry in which our American people have already invested more than three billion dollars.

To better understand our situation, a brief description of our physical layout is appropriate. Our Office in Washington is assisted by field operations offices located in New York, Chicago, Hanford, Oak Ridge and Santa Fe. These offices are organized on a functional rather than a geographic basis and are each concerned with the Commission and Contractor plants and laboratories which perform their particular phase of the work, regardless of location. New York Operations includes research, development and production. One of the main functions of our Contractor plants is to refine raw uranium ore and ore concentrates into uranium hexafluoride for the isotope-separation plant at Oak Ridge or uranium metal for the nuclear reaction at Hanford. Both of the latter operations offices produce fissionable materials for the Santa Fe Office which is involved in the development and production of atomic weapons. The Chicago Operations Office administers Argonne National Laboratory which is located in and around Chicago and is engaged in comprehensive research in biology, medicine and the physical sciences. While Oak Ridge, Santa Fe and Hanford involve one or two tremendous physical installations, New York is concerned with many scattered industrial plants and laboratories.

Many health and safety factors must be considered in studying the New York Operations plants. For this reason our New York Health and Safety Branch consists of Industrial Hygiene, Radiological Safety, Sanitary Engineering and Safety and Fire Protection Sections. Our efforts require the greatest of teamwork since we have found it impossible to explore all the ramifications of one phase without getting involved to some extent in the problems of the others.

In treating the subject of atomic energy and fire protection, it is therefore necessary to present an extremely broad view of our protection program, to include such items as radiological safety, dust control and waste disposal in addition to more definite fire topics. In reviewing some of the relatively new and certainly intriguing problems with which we are confronted, I plan in each case to view initially routine protection and secondly, emergency aspects.

Radiation Hazards

Let us first consider radioactivity. Radioactive materials emit three types of radiation, alpha, beta and gamma. Alpha is the least penetrating of these three and is completely absorbed by the first fraction of a millimeter of skin surface. Consequently, external alpha exposure can be disregarded. However, alpha emitting materials do present a hazard if ingested or inhaled, since they then come in contact with internal body tissue. While beta is more penetrating than alpha, it actually does not penetrate very deeply and the principal danger is that of exposing the entire body to radiation from a relatively strong beta source. Gamma radiation is the most penetrating of these three types and must be guarded against, because

in sufficient dose it may affect the skin and the internal blood-producing and reproductive organs.

Personnel protection from radiation may be achieved variously by shielding, by ventilation, by control of distance from the source of radiation and by control of the time of exposure. Studying radiation from the viewpoint of routine protection, employees in our plants are guarded by shielding, remote controls, safety interlocks, medical examinations, radiation surveys and personnel monitoring. Effective shields are provided by utilizing materials with a high density such as lead or concrete. Remote controls permit taking advantage of the fact that radiation diminishes as distance from the source increases. Safety interlocks are provided to prevent exposure to intense sources while "hot" processes are in operation. Medical examinations are given at regular intervals in order to detect any very first indications of overexposure.

Radiation surveys are made of all plant areas using appropriate detection instruments for alpha, beta and gamma. Ingenious devices have been developed for personnel monitoring such as pocket ionization chambers for measuring gamma, and film badges and rings in which the darkening of film is an index of beta and gamma exposure. With these various devices, it is possible to determine the radiation dose of any particular employee. This enables us to adjust conditions to keep his dosage within conservative tolerance levels. The levels presently in use have been developed as a result of some forty years experience in the radium and X-ray fields, and basic figures were recommended by the National Bureau of Standards and American Standards Association. It is expected that preferred levels will shortly be reduced by half, not because the present levels are considered hazardous but because it has been found possible to so control exposure as to keep it within the lower figure.

Fire Fighting and Radiation

Considering the fire fighting aspects of radiation, there should be no great reason for alarm on the part of local fire department personnel who may be called on to assist us. In the first place our scattered New York plants and laboratories do not generally involve particularly "hot" radioactive sources. In some locations where we might have fires, radioactivity would not be a factor at all. In other locations where it could enter into the picture, we are equipped to monitor the area with survey meters to indicate intensity of radiation while the fire is in progress and to equip all or some local firemen with film badges. The important thing to remember, and this point cannot be overemphasized, is that our tolerances have been set very low since they are based on a lifetime exposure where a worker may be exposed day after day for many years. Individuals such as local firemen who receive a single exposure can take many times the daily tolerance limit without ill effects. After all, anyone may have been exposed to as much as fifty times the daily tolerance preferred for our workers on every occasion when we have been given a photo-fluographic chest X-ray.

We humans have a natural tendency to fear the unknown and some of us may fear radioactivity because it cannot be seen. However, in fire protection we have long been coping rather successfully with many invisible hazards such as electricity, carbon monoxide and flammable vapors. During the entire period of operation of both the Manhattan District and the Atomic Energy Commission there have been only two deaths due to radiation.

The dusts and fumes of uranium and some of its compounds present interesting problems in plants and laboratories where such materials are involved; since they are alpha emitters routine protection requires that healthful atmospheric conditions be maintained both within and without. Before appropriate ventilation and dust control equipment is designed, conditions are evaluated by air sampling. After the in-plant survey is made it is possible to know not only which operator may be exposed to excessive concentrations but precisely what part of his job may be responsible for these excesses. The process is then analyzed to the point where effective control devices may be designed. After determining the maximum out-plant concentration, it is possible to recommend air cleaning equipment which will reduce the plant effluent to a point below that which will create dangerous ground level conditions.

Respiratory Protection of Fire Fighters

For worker protection, respiratory equipment is rarely used and then only as a temporary expedient in unusual cases. In the event of fires in New York Operations Office plants handling uranium, there will be so little of such dusts or fumes involved that local firemen will not need to wear breathing apparatus specifically because of the uranium. The toxicity of uranium is of the general order of that of lead, and when we fight a fire in a paint factory we are not unduly concerned about *(To page 42)*

HOW TO MAINTAIN FUSES

By HOWARD I. PODELL, P.E., Service Engineer,
Star Fuse Company, Inc., New York City

34% of all fires are from electrical causes. What should the safety engineer look for when inspecting electrical circuits?

THE province of plant maintenance that is least examined by safety engineers is the field of electrical protection. It is certainly not a phase of operation to be left to blind faith. The degree of electrical protection—or rather the lack of protection—stands out in sharp contrast to the efforts expended by safety engineers in reducing other plant hazards.

One reason for this lapse of duty frequently given to the writer by safety engineers is that they may be familiar with the hazards involved, but they are not well informed on constructive methods of overcoming them. It is one thing, they say, to tell the electrician that his fuses are "doubled up." It is quite another, however, to tell him how to rectify the situation immediately without curtailing any operations, and without waiting for some distant time when the circuits may be rewired. And many admit that they did not know of the need for tamper-proof fuses.

As a service engineer who is continually examining plant switchboards, I find the majority of plants have one or more dangerous conditions with circuits completely unprotected against short circuits or overloads. In most cases, the situation may be remedied in a matter of hours. This finding does not apply solely to the typical industrial factory. It is equally true of institutions, stores and hotels where loss of life from panic must be avoided at all times, and of plants where explosive hazards are acute.

Lighting Circuits

Suppose we walk around a typical plant. Let's stop in the office first, where generally we can expect to find only lighting circuits. 15-ampere fuses should be the maximum size on these circuits. We find portable cords for bookkeeping machines, fans, and lamps where the probability of short circuits is rather high. However, a 15-ampere fuse will limit the amount of a short-circuit current to ¼ of the energy of a 30-ampere fuse and the fuse will blow without injury to personnel. If a 30-ampere fuse is used, however, the short-circuit flash may be sufficient to cause a fire while the fuse blows.

A glance at the lighting fuse panels shows that most of the plug fuses have a hexagon shaped window, indicating that they are of the 15-ampere size or smaller. But what of the two fuses with round windows which are 30 ampere in size? Most likely, they have been put in without thought; sometimes the larger size is used instead of determining the cause of previous blowouts.

Cartridge Fuses

The next stop is the boiler room where the electrical service enters the building, or possibly where it is generated. In a typical installation we may expect to find the following situations:

(1) One of the big cartridge fuses is charred all around the casing near the upper terminal. When removed, we find that the fuse casing breaks off in our hands. Presumably this particular circuit is overloaded, and the fuses regularly burn up on that line. With an ammeter tong tester, we can measure the load without interrupting the circuit, and will find that it is only about 75% of the fuse rating. Now this particular fuse in its charred condition could no more protect the switchboard from a short-circuit than a can of gasoline could be expected to smother a fire. Under a short-circuit, the charred fuse would shoot out a flaming mass of gas to arc over the switchboard.

(2) Taking apart the charred fuse, it is frequently found to have two or more fuse links inside. These "doubled up" fuses give no protection to the line. The practice is frequently committed by electricians in the belief that the line is overloaded and requires the extra links to carry the necessary current. But we have just found that the fuse in question was not even carrying ¾ of its normal rated load. Why didn't the fuse carry this underload without overheating and burning up? That is also something to take up after this inspection trip.

But now we are curious as to how many other fuses are "doubled

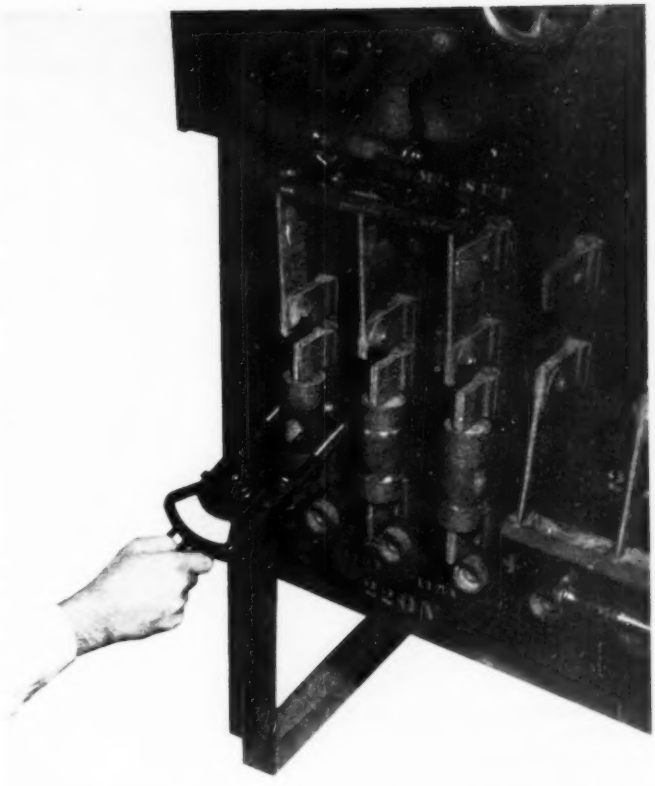
PROPERLY

up." It is not possible to tell without removing each fuse from its receptacle and opening it up. A brief survey will indicate that this type of inspection is sorely needed, because as many as 5% of the fuses may be tampered with in the typical installation. A good deal of "doubling up" is done without the electrician's knowledge, particularly where several shifts are maintained.

How to Stop the Doubling-Up of Fuses

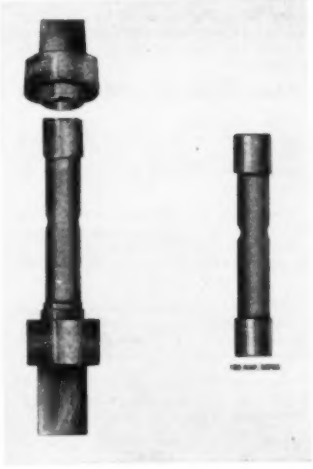
Regardless of good intentions, it is impossible for the electrician or the safety engineer to remove and inspect all the fuses once a week for signs of tampering. However, such weekly inspections would be unnecessary if the tamper-proof type of fuse were used. The electrician may point out that they cost a few cents more per fuse, but he will be able to show that they reduce many unnecessary fuse blowouts, and that the added safety furnished is well worth it.

Here the safety engineer and the electrician are on a common ground. For it is the safety engineer who can best evaluate the advantages of fuses which can't be tampered with and estimate the significance of price differential. He is aware of the losses suffered by the best insured plants when they have to shut down because of a fire. Tamper-proof renewable fuses are constructed so that only one refill, and that of the proper

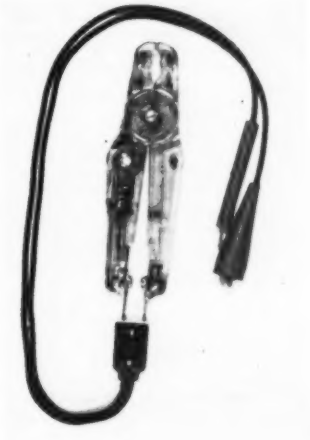


Testing the current of overheated fuses to determine whether the fuses are actually overloaded beyond their rating, or require replacement. The tong-tester is insulated and reads in amperes. Regular checking of this type will detect overloaded circuits and weed out the worn fuses.

★ ★ ★



LEFT—
Tamper-proof renewable fuses prevent "doubled up" links. The renewable element is separately housed in a tubular cartridge. Elimination of bolts, nuts, and washers is accomplished by the use of spring copper terminals. By preventing the typical refilling abuses, this type of fuse guarantees safe protection at all times.



RIGHT—
Insulated plastic fuse puller with internal test lamp and probes for detecting blown fuses. The pliers pull fuses of 10 to 100 amperes in size and test circuits of 110 to 600 volts. Serious injuries have occurred from electrical shocks in pulling fuses by hand, particularly to men standing on floors of concrete or steel.

range, may be placed inside the fuse at one time.

Tamper-Proof Fuses

A superficial check of the panel board with a glance at the tamper-proof fuse labels is a sufficient guarantee that all such fuses are safe and tamper-free, and that their removal for inspection is unnecessary. But it would be of little value to use a tamper-proof fuse if they continued to blow below their rating with consequent interruptions to service. Fuses blow out because of heat generated inside the fuse, at the contacts of the fuse, and particularly at the contacts inside the fuse. A good tamper-proof fuse should have large copper-to-copper internal contacts, and a well machined cap to conduct the heat outside of the fuse. With such a construction, the fuses will dissipate heat below their normal rating, and will blow out above that rating, rather than simmer and char until their casing is burned away.

Of importance also is the need for clean contacts on the switchboard. Poor contacts at any one spot will generate enough heat to blow out adjacent fuses and to burn out the temper of the fuse clips.

One attempt to prevent doubling up of fuse links has been the use of non-renewable fuses. However a great deal of tampering in this style has been reported. The non-renewable fuse is constructed of the least expensive material, does not have heavy contacts, and cannot carry full load current under operating conditions for a length of time. They invite tampering in order to maintain service. Also some electricians are reticent to throw away the larger sizes and instead attempt to refill them in their own fashion.

Circuit Breakers

It is not possible to inspect circuit breakers since they are generally sealed. But it is a good practice on the small sizes, such as the 15-ampere type, to periodically check with a specified overload (such as 22½ amperes) and see whether the device opens within one or two minutes. After long use, it is possible for the circuit breaker setting to drift from its initial rating since it relies on spring tension. Unfortunately, it is not feasible to check the larger sizes, although they should be examined regularly to make sure that they are in good mechanical condition.

Motor Fuses

With regard to the proper size fuses for electric motors, each safety engineer should consult the latest edition of the National Electric Code hand book. In general, a single phase motor having overload protection in its starting box should have a fuse which is rated at about 3 times its running current, or approximately ½ of its starting current. Wound rotor and direct current motors are fused at 150% of the running current. Where no overload protection is available in the starting box, A.C. motors should have a special thermal fuse which is rated slightly above the running current. Thermal fuses are not recommended for lighting circuits and are unnecessary on the larger size motors which have starting boxes and overload protectors.

To understand the danger of fuse tampering, we must consider the two different conditions under which fuses are used to protect the circuit. On the one hand, we have *overloads* which are currents of 125% or more of the fuse rating. In the other category are *short circuits* which may be 1000% and higher than the fuse rating.

Short Circuits

Short circuits, because of their magnitude, are by far the most hazardous. The fuse must open the circuit within a few hundreths of a second, must prevent any flashing at the switchboard, and limit the amount of flash at the point of short circuit. Under short circuits, sudden gas pressure is generated inside the fuse, and it is this pressure which quickly *(To page 39)*

Seven Hints for the Safe Use of Fuses

1.) Limit all fuse sizes on lighting circuits to 15 amperes maximum. 15-ampere plug fuses have hexagon-shaped windows; 15-ampere cartridge fuses have blue labels.

2.) Make periodic checks of all panel boards. Look for signs of overheating. At periods when plant is shut down, remove all fuses and check for "doubled up" links. The inspection will be a good opportunity for the electrician to tighten up the inside of the fuses and will preserve their life.

3.) Where "doubled up" links are found, or where step 2 is unfeasible, use non-tamperable fuses.

4.) Have current tests made during operating periods to determine the actual load on circuits which overheat or have "doubled up" links. Heat does not necessarily mean current overloads, as such tests will indicate, but it generally means the presence of loose contacts.

5.) At the earliest opportunity, isolate all emergency circuits from your main feeders. In some cases tampering has been reported because both emergency circuits and operating circuits came from the same feeder. The urgency of maintaining the emergency circuit is used as an excuse for tampering with the main circuit fuses.

6.) Use only Underwriters Laboratory Approved fuses. And remember that the U.L. approval represents the MINIMUM safety standards enforceable on an industry wide basis. They do not represent the maximum safety standards which you may achieve by selecting the particular approved type for your plant.

7.) Replace burnt out fuse casings. Approximately 34% of all fires are attributed to electrical causes. Good safety engineering could have prevented most. The first step in fire prevention is good electrical protection.

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19

Hospital Fire Inspections

ANNOUNCEMENT was made recently that the National Board of Fire Underwriters, with the cooperation of the American Hospital Association, the American Medical Association, the Association of Casualty and Surety Companies and the National Association of Insurance Agents, will undertake a country-wide inspection of hospitals for fire safety purposes with a view to preventing loss of life in hospital fire tragedies such as have occurred recently.

The inspections will be made entirely on a public service basis under the direction of experienced fire prevention and safety engineers without regard to rates, premiums, or other commercial aspects of insurance. In addition to the groups mentioned, the cooperation of fire marshals and fire chiefs as well as other interested Federal, state and local officials will be sought in the work. Where steps of a similar nature are already under way at the instance of state and local authorities, the National Board hospital inspection will be coordinated with them.

For some weeks the proposal to make these inspections on a nation-wide basis has been under consideration by the National Board, which is maintained by some 200 fire insurance companies for the purpose, among others, of initiating and carrying on practical fire prevention and safety activities. In order to develop and direct this particular project, the Executive Committee of the National Board of Fire Underwriters has appointed a Special Committee on Hospital Inspection headed by Colonel Perrin C. Cothran of Hartford, Chairman of the National Board's Standing Committee on Adjustments. The other original members of the committee are the chairmen of the standing committees on Fire Prevention and Engineering Standards, William B. Rearden of Newark; Construction of Buildings, R. L. Tanner of New York; Statistics and Origin of Fires, D. C. Bowersock of Boston; and Public Relations, John A. North of Hartford. The Committee is to be enlarged to include representatives of the cooperating organizations.

Medical and insurance organizations have not only expressed interest and enthusiasm but also have agreed to cooperate wholeheartedly in enlisting their constituents.

To Inspect 6,000 Hospitals

It is estimated that the inspections will cover some 6,000 hospitals in the United States, including Federal, state, city and privately-owned and voluntary hospitals of all kinds. The plan is to have the inspections made by trained fire prevention and safety engineers from the inspection and engineering bureaus of the National Board and all other organizations in both the fire and casualty insurance business, with the aid of specially qualified field men of the individual companies. In order to facilitate the work, inquiries are now being made as to what, if any, general inspections of hospitals are under way or planned in the various states and what machinery and organizations exist to perform such inspection duties. The various cooperating associations also have under study a draft of a questionnaire which is intended for use in supplementing the personal physical inspections by the fire prevention engineers.

Will Cover All Hazards

The inspection by these trained fire prevention and safety engineers will deal not only with structural features and conditions in the hospitals, but with other physical arrangements and "housekeeping" methods for the elimination of hazards. Fire safety practices and fire drills also will be considered.

"It is not enough to inspect for bad housekeeping, blocked exits, sticking exit doors, and such commonly-looked for hazards," Dr. J. J. Golub, Chairman of the American Hospital Association Council on Hospital Planning said in approving preliminary plans, "but also to study provisions for early discovery and early reporting of fire, physical arrangements to prevent both the vertical and horizontal spread of fire, and also records of systems which indicate organization for and attention to provisions for fire drills and evacuation procedures. The common mistake of planning fire drills and evacuation procedures for daytime hospital crews should be watched for in order that the plans when necessary may be revised to contemplate how fire emergencies will be handled by the minimum crew on duty at any time during a 24 hour period, and this is usually after midnight."

Colonel Cothran said that the plan contemplated directing inpections first to the hospitals considered to be most vulnerable to fire and loss of life from fire, or hospitals that are not fire resistive or equipped with sprinkler systems and other desirable protective features. The period of time required for inspection of 6,000 hospitals will be considerable, and some structures not on the list for early inspection by fire safety engineers will be checked by other trained insurance men with the assistance of a carefully prepared check list or questionnaire.

Inspection reports will be furnished confidentially to the hospital administrators and other authorities interested in effecting improvements on the basis of the findings. In view of the interest expressed by hospitals and other authorities it is anticipated that early and effective results will be achieved on the basis of the full cooperation already promised by the organizations concerned.

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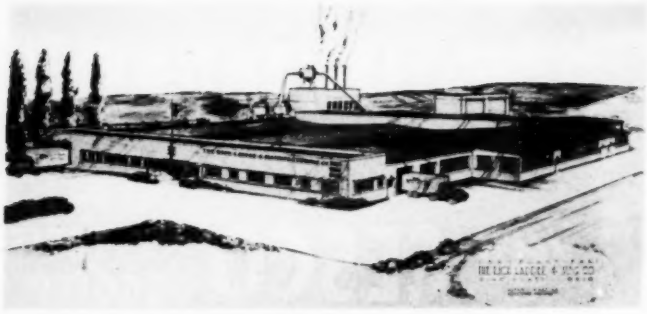

New Ladder Factory Designed for Safety

PICTURED above is the new factory which has just been completed by the Rich Ladder and Manufacturing Company, 5040 Lester Road, Cincinnati, Ohio. The factory, located on a 17-acre tract of ground, is believed to be one of the most modern woodworking factories in the country. It is a one story brick building that was designed specifically for the manufacture of ladders, painters' equipment, ironing tables, and related woodenware items manufactured by the company. The new factory represents the company's third expansion since its inception 50 years ago.

Included in the project, in addition to ultra modern air conditioned offices, are approximately 90,000 square feet of manufacturing space, the most modern type of dry kilns, separate railroad sidings for both inbound raw material and outbound finished products, a resaw operation capable of converting large timbers to lumber of any size necessary in the manufacture of the company's products, a specially designed Babcock and Wilcox boiler plant that uses the sawdust developed in the manufacturing operation as fuel to heat the entire operation.

Interesting features in the factory include a network of bus-ducts, honeycombing the ceiling in such a way that it is possible to move any machine in the plant simply by detaching its conduit from the bus-duct in much the same way that a light cord is removed from a wall socket, moving it to its new location and plugging the conduit into the bus-duct again.

To increase safety, reduce fire hazards, and increase employee efficiency, all woodworking machines are interlocked electrically with the sawdust collection system, thus making it impossible to operate any machine without having the sawdust collection system turned on automatically. A completely mechanical lumber handling system, using both lift trucks and straddle trucks, contributes further to efficiency and employee safety.

New woodworking machines, a number of which were designed especially for the Rich Ladder and Manufacturing Company, are further evidence of the company's progressiveness and its desire to serve the public with products of the highest possible quality.

The Rich Ladder and Manufacturing Company extends a cordial invitation to its many friends to visit the new factory at any time and to see it in operation.

Position Wanted

Experienced safety engineer available. 42 years old; college-trained; with 14 years of diversified safety experience, including construction, traffic, fleet, industrial and fire prevention. Prefers to locate in west, southwest or south. Write c/o Box 620, Safety Engineering, 75 Fulton St., New York 7, N. Y.

Safety Campaign By Gray Iron Society

HERMANN P. GOOD, President of the Gray Iron Founders' Society, recently appointed a national gray iron foundry safety committee. Authorized by the Society's Board of Directors, the Committee will formulate plans for a down-to-earth safety program for the industry, including the preparation of a Code of Safe Working Practices for each department of the foundry.

R. L. Collier, Executive Vice-President of the Society, commenting on the plan, advised that stress will be laid on the advisability of foremen and supervisors taking the necessary time to drill the employees in their respective departments on the occupational hazards that exist therein and the safe working procedures which will obviate all or most of the injuries commonly sustained by workers engaged in such occupations.

Members of the Committee, carefully picked for their experience and proved ability in personnel and safety work, are G. A. Riley, Supervisor of Safety, American Brake Shoe Co., New York, Chairman; Edmund Gilliam, Safety Director, Eaton Mfg. Co., Detroit; Kenneth R. Nichols, Safety Director, The Cincinnati Milling Machine Co., Cincinnati; Frank O'Malley, Personnel Director, Ferro Machine & Foundry Co., Inc., Cleveland, and Harold Wheeler, Personnel Director, Superior Foundry Co., Cleveland.

Airmen to Fight Fires

(From page 15) craft, administer immediate first aid if necessary, remove personnel and turn them over to medical men and the ambulance.

After everyone has been removed, the fire is extinguished if any parts of the plane are still burning—in keeping with the basic code of the Firefighters: "Protection of life is first; protection of property second."

Pictures by courtesy of U. S. Air Force.

This man, working in hot temperature, feels vision growing misty, his head hot, perspiration running into his eyes.

STOP SWEAT BLINDNESS

This man, also working in a hot temperature, keeps a clear vision, wears his goggles in comfort and is unconscious of perspiration. DRYBROW is responsible.

With the aid of DRYBROW a workman is no longer troubled with perspiration. DRYBROW absorbs 20 times its weight in water. Lasts a worker about 6 weeks.

Eliminate Accidents
Loss of Time and Efficiency
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You can't do much about the weather—but safety men find you can correct a great deal of its effect on plant workers by supplying them with cool refreshing DRYBROWS. Many plants report a 12 to 15% increase in production in certain departments with 10 - 20% less man power turnover during the hot months.

DRYBROW'S reinforced cellulose sweatband absorbs 20 times its weight in moisture. All natural rubber head band is self-adjustable — light weight and will not curl. Floating head band feature eliminates tension, makes DRYBROW light as two feathers to wear. Easy to clean and absolutely sanitary.

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TRANSPORTATION

Pallets Cut Losses

ONE of the most spectacular developments in industry during the past few years has been the transportation of goods in pallet loads. Not only has shipping efficiency been increased, but also damage to goods in transit and handling accidents to personnel have been decreased. Mechanized handling of course poses new safety problems, but by letting the machines do the work, the all-too-prevalent back strains, smashed fingers and crushed toes resulting from improper handling techniques and improper clothing can be reduced.

Like any new development, palletizing has tended to fly in all directions at once. Each company has used pallets of a size which seemed suitable for its particular packaging problems. Now, however, manufacturers are beginning to realize that there are other factors to be considered than their own problems within the company. The need has been felt for greater standardization of pallet sizes to facilitate loading of trucks and freight cars.

The U. S. Navy has made an extensive survey of pallet sizes as related to fork lift trucks, hand trucks, and the dimensions of box cars and trailer trucks. As disclosed in the Materials Handling and Packaging Conference held at the Navy Supply Corps School at Bayonne, N. J. last fall under the sponsorship of the Bureau of Supplies and Accounts and the Navy Industrial Association, the Navy has worked out the requirements for a standard type of pallet which they recommend that Navy suppliers use. In view of the extensive research behind this pallet, all industries and shippers, whether Navy suppliers or not, would do well to consider their recommendations.

One of the most widely used pallets has dimensions of 48″ x 48″ and two-way entry for fork trucks. This size is satisfactory for box cars but is often difficult to maneuver. When it comes to loading trucks, however, this pallet is inefficient, as the accompanying picture shows. The average truck body width is 88½ inches, so that only one 48″ x 48″ pallet can be placed across the width of the truck, leaving much wasted space. By using a 40″ x 48″ pallet, two units can be loaded into the truck width without waste space.

Other requirements for the Navy standard pallet are as follows:

1. Size 40 by 48 inches to permit movement by both railway freight car and trailer truck.
2. Four-way fork entry.
3. Sixty- to ninety-pound weight.
4. 3⅝ inch deck clearance for fork-truck forks.
5. Bottom-deck area to be 60 per cent of top-deck area.
6. Provision for handling by hand pallet truck.
7. Capability of being knocked down to conserve shipping space.
8. Repairability by replacement of component parts.
9. Capability to withstand static loading of 12,000 pounds and ability to perform satisfactorily under naval handling operations.
10. Overhang of 3½ inches on 48-inch dimensions for application of stevedoring slings, forming what is known as a "wing-type" pallet.
11. Be moisture resistant to the extent that dampness will not seriously affect the strength and life of the pallet.
12. Permit strapping and/or gluing to the degree required in unit loading.

Picture Official U. S. Navy Photo by courtesy of the Bureau of Supplies and Accounts, Navy Supply Corps School, Bayonne, N. J.

DDT for Bugs DDD for Humans

DDD is the new formula for peril in traffic!

"DDD" stands for darkness, dusk and dawn, the hours of reduced natural light when traffic dangers are at their peak.

As an example, The Street and Traffic Safety Lighting Bureau refers to a report of the Illinois Division of Highways covering accidents for 10 months on numbered state highways outside of cities.

This report, the Lighting Bureau points out, shows that 57 per cent of the fatal accidents occurred in DDD hours, despite the fact that only 44 per cent of all accidents happen during these hours. The

SAFETY

actual figures are: 321 of 7,947 accidents, or one in each 25, fatal during darkness, dusk and dawn as compared with 246 of 9,962, or one in each 48, during daylight.

The Lighting Bureau reports that dark-hour fatalities have been reduced more than 50 per cent by installation of adequate illumination.

It Was the Other Guy's Fault

WHO is to blame? Sometimes, in fact, pretty often, both parties to an accident may be in the wrong. For example, the driver of an oil company truck pulled to the left as he approached an intersection in order to make a short right turn, but failed to give the proper hand signal. A driver behind him was attempting to pass on the right side of the truck without sounding the horn of his car. The rear view mirror of the truck was out of adjustment, but fortunately other occupants of the truck saw the car attempting to pass and advised the truck driver to stop. The car skidded past the stopped truck, only grazing the fenders.

Clearly both drivers made mistakes which could easily have resulted in something more serious than a new fender paint job. The truck driver flaunted safe driving practices by neglecting hand signals and by not having the mirror in proper adjustment. The driver of the car was courting death in trying to pass at an intersection, especially on the right hand side, without a clearance signal from the truck, and without giving any warning himself.

So You Think You're a Safe Driver?

TO SAY that safety awards are a dime a dozen is not meant as a disparagement of an accident-prevention technique which has much to recommend it. Instead it means that the practice of giving safety awards has become so universal that we are likely to forget the real implication of the award.

A case in point is the recognition given to drivers of the Refined Syrups & Sugars, Inc. for their safe driving records. For three consecutive years the company's drivers have placed first in the Commercial Vehicle Section of the Greater New York Safety Council's Accident Reduction Contest.

But the story behind this story is what happened at the award presentation dinner given by the officers of the company for its drivers. At that time, an unsolicited letter was read which showed the real significance of the award and the notable achievement of these truck drivers. You may think you are a good driver and a safe driver, you may even have some medals to prove it, but, brother, if you can get the other drivers on the road to back you up, then you really must be good. Here is the letter:

To the Truck Drivers
Hudson Valley Sugar Corp.
Dear "Fellers":

I am a bus operator on the Riverdale Avenue bus line, Route No. 10, and have been for a number of years.

I am taking this opportunity of doing something I have wanted to do for a long time. I want to thank each and every one of you fellows that drive the "Flo-Sweet" tank trucks for the courtesy and cooperation I have received from you. Each one of you is always ready to give me the right-of-way, especially when I am waiting for a break while making a left turn northbound at 231st Street and Broadway. Whenever and wherever I meet one of you boys I know that I am going to be treated with the respect of the highway in spite of the fact that I know full well there are many bus operators that would not do the same for you.

Regardless of the aggravation of some passengers, I try to practice courtesy myself. The way you boys stand out among the other local truck drivers gives me the inspiration to keep at it.

I am sure that if I took the time out to ask my fellow bus operators on Riverdale, they would feel the same way I do about it.

Thanks again, boys.
Yours with the green light,
(Signed) Eric (Scottie) Langfier

President's Highway Safety Conference

AS A result of deliberations at the President's Highway Safety Conference held recently in Washington, a movement is growing to measure the progress of highway safety throughout the nation by all types of accidents rather than by fatal accidents alone. According to Julien H. Harvey, manager of the Accident Prevention Department of the Association of Casualty and Surety Companies, emphasis on the need for a more accurate measuring device than the fatality rate was one of the most interesting developments of the June 1–3 meetings, held this year for the double purpose of reporting on progress and determining the work still to

be accomplished by states and communities in putting into real effect the recommendations of the Action Program adopted at the first conference in 1946.

Mr. Harvey said that the criterion of safety now generally accepted is based solely on the fatality rate—the number of deaths per 100,000,000 miles traveled—without taking into account the personal injury and property damage accidents which cause great suffering and loss each year. There is a wide divergence among states in the reporting of property damage accidents, he said, making comparative statistics difficult to obtain, but almost all states require personal injury reporting. Mr. Harvey predicted that if these personal injury reports are more closely analyzed in addition to the fatalities, a real improvement in the adequacy and use of accident records will be achieved.

Regional Plan

Another innovation in the 1949 conference was the regional discussion plan incorporated in the agenda. Several months ago it was announced that, for purposes of reporting at the June meetings, the country was to be divided into five different regions, faced with a similarity of highway safety problems. The Association's Accident Prevention Department was asked to handle organization and detail of Region "B," including the heavily-populated states of New York, Pennsylvania, Ohio, Indiana and Michigan. Thomas N. Boate, public safety director of the Accident Prevention Department, as regional liaison officer, spent the intervening months between his appointment and the June conference in consulting with state and city officials throughout the region. This gave all officials connected with the highway safety program an opportunity to state what courses of action should be followed. It also uncovered existing weaknesses in the Action Program in the various states and municipalities thus determining the subject matter for the regional meeting at the conference. Attendance at the Region "B" sessions was heavy, said Mr. Boate, including over 300 delegates from the five states. With Governor G. Mennen Williams of Michigan presiding, the group discussed the proposed provisions of the Regional Action Program prior to its submission to the conference for adoption as a part of the nationwide 1949 Action Program. On the third day of the conference all regions came together in general session for a consideration of the regional reports presented by the five state Governors chosen as regional chairmen.

The Committee on Engineering brought out several projects for concerted action that should be of vital interest to the general public, said Robert Allen, committee member representing the Association. Among these was the need for definite action against the diversion of parking meter revenues to any other source than traffic improvement. Other projects under discussion included the stimulation of state officials to take the initiative in getting local authorities in on the program and the need for competent engineering guidance in the installation of traffic signals and other improvements. The point was also made that many municipal units are not using the traffic engineers they have employed to their fullest capacity. Engineers should be called on for analysis and planning as well as installation jobs. Expansion of the traffic training program was accorded an important part in the discussions of the engineering group, said Mr. Allen, since adequate training of engineers in highway design, traffic and maintenance is in many ways the crux of the problem.

Officially requested by the conference to report progress nationwide on the High School Driver Education Award Program, the Association was represented by Harold Danford, education director of the Accident Prevention Department, at the meetings of the sub-committee on secondary education. Statistics assembled by the Association are being used to measure the growth of the driver education program, and a full report will be available within the next few months from the U. S. Printing Office at a nominal fee, Mr. Danford said.

Movies Show the Safe Way

(From page 13) there is no excuse for not using films of every kind.

Many dealers have libraries and projectors for the rental of films and equipment at reasonable prices.

It should also be noted that while many motion pictures are available on a rental or free industry-sponsored basis, it has often been found desirable to purchase the film outright, as it may be used repeatedly for different groups or to follow up with the same group, and there is no question of delay in obtaining it when desired. Actually the price is extremely low, outright purchase costs ranging from $25 to $100 per picture.

Safety is being taught everywhere through sight. A most effective method is by the use of the 16mm sound motion picture. Other methods of trying to get safety across to the employee may fail or be only partially successful, but when a movie is offered, the employee will STOP—LOOK—LISTEN!

Pictures by courtesy of the Castle Films Division of United World Films, Inc.

New Products for July

Finnell Mop Truck
Quick Aid Extinguisher
Broken Bulb Remover
Insulation Tester
Chisel Grip
C-O-Two Extinguisher
Plyglov
Salt Tablets
Non-Slip Soles
Plastiguard Gloves

See pages 65–66

How workers look at safety goggles . . .

"Are they comfortable?"

The answer to that question in your plant will determine to a large extent how effective your safety program is.

MonoGoggle Style No. 1

To most workers, comfort—or the lack of it determines whether or not they wear goggles or carry them around in their pockets. Whether they need safety spectacles, heavy duty goggles or plastic eye protection for minor hazards —look to the WILLSON line for comfort that gets safety equipment worn. The lightest weight commensurate with safety in a given operation; a choice of sizes; adjustability for exact fit; anatomically shaped eyecups and frames; and other comfort features make WILLSON safety equipment "easy on the eyes."

DAILY REMINDERS

Such as Willson "Blind Man" Safety Posters keep workers aware of the need for wearing goggles. Supplies available on request.

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Traffic Institute

EARLY in June, the Center for Safety Education at New York University held a one-week traffic institute to further the cause of highway safety. Herbert J. Stack, director, reports that the institute achieved gratifying results which were due, in large part, to the fine spirit of cooperation among both instructors and students.

Certificates were awarded for courses in Pedestrian Protection, Chemical Tests for Intoxication, How to Sell Traffic Safety, High School Driver Education, and College Professors and Supervisors. A conference for judges and prosecutors and a credit course in Driver Education were also held.

From the viewpoint of the Center, the course for college professors and city safety supervisors was particularly noteworthy, with seventeen states represented, including nine individuals who were in a state supervisory capacity. It is encouraging to see this increased interest by state units, because the frequent political changes in state government present a real problem in traffic safety cooperation.

The Center for Safety Education is aiding Northwestern with its Traffic Institute in July, California in August, and Yale in September.

Safety Committee Program

(From page 12) resulted in a sense of frustration in the committee members because of their inability to get prompt action on their ideas.

Steering Committee Plan

As a result of this apparent inability to gain prompt decisions, the whole idea of committee participation was thoroughly reviewed. In the course of a heart to heart talk with members of top management, their attitude was stated unqualifiedly that safety should be given first consideration even over production, quality, and cost. As a result of this real interest in safety by top management, a new and rather unique committee organization was established about August, 1947. As far as this plant is concerned, it seems to have "rung the bell." As of January, 1949 this plant succeeded in operating 2,600,000 man hours without a reportable injury which was the best record ever made by this or any other Monsanto plant.

This organization consists of only one permanent committee called the Safety Steering Committee. This is made up of eight persons from management. The top production executive is chairman and the plant safety engineer acts as chairman in the chairman's absence. The other six members serve for periods of six months and are drawn from various levels of supervision. All safety policies, projects, expenditure requests, etc. are submitted to this committee or its chairman for approval, and because of his relative position in the organization, decisions are rendered without delay. As a matter of fact, very frequently decisions are rendered where necessary without benefit of referral to the Steering Committee as a whole. It was decided by the Steering Committee that a satisfactory method of gaining participation in safety work could be obtained by periodically selecting committees from the plant for the purpose of developing and administering a short-term safety program which would emphasize some specific phase of safety and then charge this committee with the complete responsibility for development and administration of their project. These project committees are selected to serve only for the period necessary to develop and put into effect a specific program. One month periods were also selected for executing each project. For example, for January, 1949 it was decided that the project for emphasis should be "Hand Tools." In October 1948, a committee was appointed and given their assignment. This committee consisted of five members of supervision and one member of the hourly paid group. One member was appointed chairman and a member of the safety staff acted as advisor.

The safety engineer acting as vice-chairman of the Steering Committee meets with the newly appointed project committee and charges them with the responsibility for developing and executing the project as selected by the Steering Committee. At this first meeting is presented some of the basic reasons for the selection of the specific project. In developing the project, and in assigning responsibility, only two reservations are made. Whatever devices, ideas or methods they decide to use, they must be in good taste, and the expense must be within the amount allowed in the Safety Department budget for that purpose. At the present time this amount averages $200 per month.

You may ask what type of ideas this committee brings forth for an effective program. It is well known that educational activities, advertising, either of ballyhoo or the quiet type, the element of competition, etc. can well be a part of such a program. In actual practice these types of activities are completely explored and used. All committee members are required to give as much time as they feel is necessary to develop and administer a program, but the program has got to be good. This activity is just as much a part of their job as operating their department. To illustrate some typical activities: during the "Hand Tool" program every one of the 300 personal tool kits of each of the several maintenance crafts were inspected by a committee and the possessor of the best maintained tool kit, from the standpoint of condition, and neatness, was given a prize consisting of a tool which would very well fit into their particular tool kit (see illustration). During the week, when these inspections were running, the interest developed among our mechanical groups built up to an extremely high level. In general, this is a difficult group to interest. During that same month the plant

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NEW long-wearing Trim Edge Appearance for dressy wear anywhere . . . Do not pick up steel scraps, chips, etc.

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THE DAVIS LINE FOR LINEMEN
MADE RIGHT FOR LONGER LASTING LIFE
DAVIS TOOL BUCKETS
DAVIS GLOVE BAGS

TOOL BUCKETS—Made of 18 oz. canvas in one piece. Bottoms are tough, water-proofed one piece formed leather to resist weather rot and warping. Heavy stitching stands up under tool abuse in hitting bottoms. Rim of bucket is reinforced by specially shaped, rolled fibre ring. Send for list of available sizes and types.

GLOVE BAGS—Proper size to hold any length rubber gloves and protectors without folding. Gusset sides permit carrier to be flat when empty. Two-way snap hook with D ring permits bag to be attached to belt. Made of heavy, closely woven No. 6 water-proof duck—double stitched. All seams are bound for longer life. Write for prices.

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SEND FOR OUR COMPLETE PROTECTION CATALOG

SAFETY DAVIS DIVISION

DAVIS EMERGENCY EQUIPMENT CO., INC.
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was divided into several areas. One morning when everyone came to work, flying high in the air over each of these divisions was a 4-foot in diameter, (helium) gas filled, orange balloon. It was not until later that day that bulletins were published indicating that as soon as any one of these areas suffered even a minor hand tool injury, a black ball would be hoisted in its place. Even though this idea was relatively inexpensive, the amount of interest created not only in the plant but in the community was amazing. For a further program activity, all hourly paid personnel were shown a sound movie on the subject of "The Use and Care of Hand Tools." This type of publicity, the hand tool inspections, both by craft and in operating areas, safety meetings for the purpose of instructing people in the proper methods, and safe use of hand tools were all a part of this program. We consider this a very successful program because since that program the minor hand tool injuries have been reduced appreciably.

Other subjects which have been selected for emphasis were Safety Shoes, Employee Health, Housekeeping, Fire Prevention, Mechanical Guards, Personal Protective Equipment, Safety Color Code, Unsafe Acts, etc.

We do not guarantee or feel that this type of program will be successful forever but it certainly has produced results and the level of enthusiasm is still as high as when we started.

It is felt that this type of a committee setup, where responsibility is delegated and authority is given directly to these committees to develop and produce, is one of the major factors which makes this type of organization work. The committee members are not bound by red tape, delay, or anything not of their own choice.

Another factor is the continual high level of interest maintained in safety activities. This factor is made possible, we feel, because each project is developed by an entirely new group of people and new people produce new ideas. In the period of 18 months there have been very few ideas duplicated.

How much time these people spend developing and administering their program varies considerably. However, the directive to these committees states very definitely that they shall develop and administer the program and take whatever time is necessary and that "Safety is a part of every man's job in this plant." Over a period of one and one-half years there have been more than 125 members of our supervisory and hourly group who have actively participated in the development of these specific projects. Invariably when their tour of duty has been completed, the Company has found that it has developed several more disciples for accident prevention. Occasionally, immediately following an appointment to a committee, there is a certain amount of comment by the new appointee as to

his lack of time to participate in such a program. But almost without exception the spirit of competition and enthusiasm and the fun arising out of developing and carrying out these programs has entirely changed his attitude toward the committee activity and toward accident prevention.

We read much in various publications about safety committees, how to organize them and how they work. Inasmuch as safety engineering is a cooperative venture, it is felt that someone, in some fashion, may benefit by experiences as related in this article. It is not claimed that this type of committee organization will work elsewhere, but it has worked and is working here with outstanding results. We tried diligently to use other standard types of committees, but for one or another reason they just did not work for us. We much prefer to spend money on programs to *prevent* injuries than to spend money to treat them.

Pictures by courtesy of the Plastics Division, Monsanto Chemical Company.

New Safety Sustaining Service

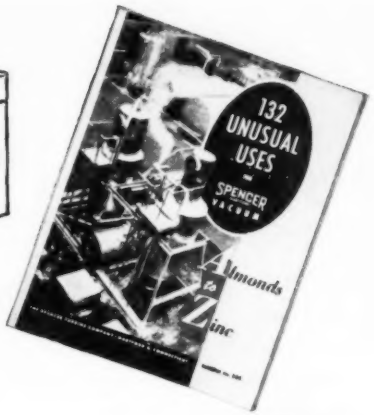
DONALD MONROE, Safety Consultant with offices at 475 Fifth Avenue, New York, has organized what he calls a Safety Sustaining Service.

This new service is aimed to serve so-called "part-time" safety men and men who have just been given responsibility for safety—as well as old-timers looking for a fresh perspective toward their job.

The plan requires first a careful analysis of existing conditions, whereupon specific procedures are recommended to management.

The unique feature of this new service is that the cost tapers off. After the initial cost of the analysis and of the period of organization (usually 3 months), the fee is automatically reduced in proportion to the need for additional work.

Mr. Monroe's new safety consulting service is founded on the premise that when morale is good, production is high and injuries are



132 NEW IDEAS WITH SAFETY AS AN EXTRA DIVIDEND!

Here is a book full of ideas for accomplishing difficult production tasks with great speed, accuracy, and reduced costs, and yet every one of the suggestions might well be dropped into the Safety Suggestion Box.

For instance, Spencer Vacuum handles hot materials such as ashes and cinders, and cleans out the bottoms of 30 foot car wheel pits while still hot.

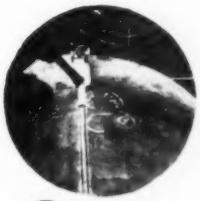
Conveying of chemicals, foods, silica sand and other materials by the ton, is accomplished without scattering dust.

Fumes from autos in repair shops, from welding operations and in chemical plants, are collected at their source.

Rock drills used in quarries or for concrete are provided with a hood connected to Spencer Vacuum.

And, with the same Spencer Equipment, floors, walls, ceilings, pipes and all machinery can be kept clean.

ASK FOR THE SPENCER BULLETIN



Recovering Welding Flux

Chemicals

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356-D

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STOP LENS WASTE

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OPTICALLY PERFECT • CRYSTAL CLEAR

Make your safety lenses last 7 to 15 times longer

Save your lenses with TUF-COTE, the only true lens protection against weld spatter and grinding wheel pitting. Convince yourself, just send for a free sample TUF-COTE treated lens – give it the works in your own shop, and you will insist on having us treat all the glass safety lenses of your spectacles, goggles and helmets with TUF-COTE.

We grind and treat prescription lenses too. **TUF-COTE will leave them optically perfect, even clearer than before. For replacements order Wallace Eyeguard prescription glasses, TUF-COTE treated.**

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and our "know how" allows us to quote very favorable costs to manufacturers—and with the finest quality. Let us quote on your needs.

SAMUEL GRANOFF

CENTRAL FALLS, R. I.

few! This new plan gives morale prime consideration.

Canadian Glass Plant to Reopen

PITTSBURGH Plate Glass Company through the Canadian Industrial Glass Company, Ltd., a newly organized, wholly owned subsidiary, has purchased from Industrial Glass Company, Ltd., a window glass producing plant at St. Laurent, Quebec, Canada, according to an announcement by H. B. Higgins, president of the Pittsburgh firm.

Fifty thousand shares of Pittsburgh stock, equal to approximately $1,500,000 have been issued to Industrial Glass Co., Ltd., for land, buildings and equipment of the St. Laurent plant.

At present the plant is closed for repairs to the glass melting tank and other equipment. Production will be resumed as soon as repairs are completed. According to Mr. Higgins this should be within a 30 to 90 day period.

Reopening of the plant will afford Canadian glass dealers, distributors and builders with a constant supply of high quality window glass.

New Asphalt Shingle Has High Fire Rating

ASPHALT shingles have made tremendous strides in the short space of a few years, especially as an economical type of roofing with recognized qualities of durability and attractiveness.

Their one limitation, however, has been their relative standing among other roofing materials from a fire resistant consideration. Recognizing this fact, scientists have been giving this phase of the product intensive study for a long time.

One of the leading firms in research along this line has developed an asphalt shingle which is the first in the history of the industry to achieve the highest possible fire resistant rating of "Class A" by the Underwriters' Laboratories.

It is reported that ten years of field work and laboratory research went ahead of this development. Over 1500 roofs were checked by research workers in an area noted for being particularly difficult on roofs and roofings—from Dallas, Texas, southwest to San Antonio, along the gulf to Houston and New Orleans, La., Pensacola, Fla. and up to Birmingham, Alabama.

Additional claims made for this new asphalt shingle are that it is the only shingle of any kind ever to be rated "Class A" without an asbestos felt underlayment; it can be used without limitation in any area requiring the highest fire rating; no special methods of application are required when roofing with this improved product; its extra thickness and weight (325 lbs. per square) provide longer life and greater protection from wind and the elements.

It has been known for some time that asphalt shingles blister when roof deck temperatures "build up" on hot, summer days—that the blister starts in the felt and pushes

up through the top coating of asphalt, which, until now, lacked the tensile strength to resist it.

Also of common knowledge is that one of the major reasons for the low fire resistance of ordinary asphalt shingles is that the asphalt coating melts and flows away from the felt, thus directly exposing it to the flame.

The secret of the new shingle is found in its top coating. This coating is an achievement which eliminates the inherent weaknesses found in other asphalt shingles and gives it the fire resistant properties scientists have been searching for during the past twenty years.

The asphalt coating applied to the weather-exposed side of the felt contains a patented asbestos-bitumen plastic compound which, when applied to the asphalt shingle, lifts it out of the class of other such shingles and places it in the category of "Class A" roofings.

This compound, furthermore, has other important attributes which give added qualities of safety. In the first place it renders the asphalt coating flow-resistant when exposed to the high heat or flame, thereby preventing the flammable felt base from exposure to the flame. It also forms a "skeletal mat" of high heat insulation properties which shield the underlying combustible roof deck from the heat of the flames. Then, too, this compound makes the asphalt coating highly resistant to combustion so that it tends to char very gradually, thus discouraging continued burning when the flame is discontinued. And finally, it increases the tensile strength of the asphalt coating, enabling it to resist blistering when roof deck temperatures soar as high as 170 degrees F.

The name of this shingle can be obtained by writing to the Editor.

"WHY TAKE A RISK?"

HEAD SAFETY OF YOUR PEOPLE IS OUR MUTUAL OBLIGATION

•

Paramount Safety Helmets Will Guard Against Injury May Save a Life

C-80 Helmets — D-80 Caps

Our Plastic Safety helmets and caps are light in weight . . . comfortable, waterproof, and resistant to 3000 volts electricity . . . adjustable to head sizes and shapes 6½ to 8 . . . allow adequate clearance space all around, between head and helmet-crown to cushion and absorb blow . . .

These safety helmets and caps with genuine leather suspension sustain 80 foot pounds under ball impact test . . . Made of finest materials and best workmanship.

Miner's Lamp Bracket

Adaptable to all types of miner's lamps . . . furnished installed on either helmet or cap . . . nonconductor electricity.

Winter Lining

Two piece lining, flannelette facing . . . sanforized, warm, skull cap with detachable ear laps . . . fits any size head.

We have produced millions of M1 Army helmet liners . . . the famous Cairns-Paramount Fireman's helmet . . . the Army, Navy and Civilian Air Corps crash helmet for jet pilots and other air corps personnel . . . the Army Quartermaster Tank Corps helmet.

All these articles are produced under one or more of these patents, No. 2-420-522–No. 2-423-076, others pending.

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How to Maintain Fuses

(From page 24) extinguishes the electrical arc. A little earlier we discussed fuses with charred and weakened casings. Under the gas pressure generated by a short circuit, charred fuses literally explode. The flaming gases, because of their electrical conduction properties, cause additional short circuits on the fuse board. In such cases, needless to say, the damage at the point of the original defect is considerably greater when the arc is not immediately extinguished. The short-circuit current is generally about six to ten times the fuse rating, and requires split second opening of the fuse or circuit breaker to prevent damage.

Since short circuits on feeder lines are not frequent, the maintenance crew may give little consideration to their occurring. That is why the safety engineer has to give the subject his full attention. Just one short circuit is disastrous on a tampered circuit.

Overloads

The second type of fuse protection, overload protection, is frequently called upon. In the course of time, installations are likely to have additional branch lines added without increasing the size of the main feeders. Lamp sizes are in-

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GLOVES COST YOU MONEY
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creased, and the possibility occurs that at some periods, the lines, or wires inside of equipment, may be carrying enough current to overheat and to destroy the insulation. Fuses are designed to open up on these overloads over a period of time. The higher the overload, the faster the circuit is to be opened. On very short overloads, such as starting of motors, the fuses are supposed to carry the circuit, as such brief loads do not overheat the wiring.

Over periods of time, fuses which have bolted connections or bi-metal, zinc to copper, mechanical contacts, loosen up inside. Once the internal contacts are loose, such fuses will then blow below the fuse rating. It is this category of fuse which the electrician "doubles up" to prevent unnecessary fuse blow-outs.

We have found that by using copper-to-copper spring contacts we can prevent fuses from blowing below their rating under service conditions. In this way, we have removed the motive for doubling up the fuses and therefore have also eliminated the unsafe practice itself.

With reasonable maintenance fuses will furnish excellent protection since they are simple, do not have any moving parts, and are readily replaced when they show signs of wear. But wrong types of fuses, misused fuses, and tampered-with fuses will continue to make electricity the fire menace it has been in the past.

Pictures on page 23: top by courtesy of Columbia Electric Mfg. Co.; bottom, the Star Fuse Company.

Fire Safety During Plant Shut-Downs

FIRE safety during plant shut-downs is the subject of a bulletin recently issued by the Engineering Division of the Associated Factory Mutual Fire Insurance Companies. Based on actual fire experience, it lists those items requiring attention before a plant is closed for vacation or other extended period, and outlines precautions needed during the shut-down.

The bulletin points out what to do about housekeeping, waste disposal, and flammable liquids and gases in eliminating sources of fire. It shows what part of the electric power, steam power, and heating should be kept in service for fire protection, and includes specific suggestions for maintaining watch service and checking the protective equipment. Special precautions for alterations and repairs are emphasized, particularly on the use of cutting and welding torches, and during changes that involve shutting off sprinkler protection.

A copy of the bulletin may be obtained on request from the Factory Mutual Engineering Division, 184 High Street, Boston 10, Mass.

Safety Investment Versus Safety Returns

(From page 11) covered in many other articles. It is necessary but secondary in importance—the accident has happened by this time.

c. The design, procurement and use of adequate protective clothing and equipment. Sometimes this meant developing something brand new that was not yet on the market. Care and maintenance of such property had to be solved, as also the problem of discipline.
d. Safety engineering. Approval of plans for new construction, layout and alterations.

Third Phase of Improvement

This second goal was also reached, and our enthusiasm carried us to take on an additional unit of effort (making four in all) which—as indicated in the chart—should (and did) give us a frequency of 4.0. Among the activities chosen for this unit of effort were:

a. Additional employee participation in the form of contests, awards, discipline, sug-

SENSATIONALLY NEW

BUT Already Accepted By Industry

"PEP-UP"

***IMPREGNATED**

(Controlled Dissolving)

SALT TABLETS

FOR THE RELIEF OF HEAT FATIGUE

...WILL NOT CAUSE NAUSEA OR STOMACH DISTRESS

"PEP-UP" Impregnated Salt Tablets are subjected to an exclusive patented process which forms a complete coating around each crystal of salt in each tablet. This slow dissolving impregnated tablet eliminates nausea and digestive disorders usually experienced when taking fast dissolving plain salt tablets or salted drinking water.

The controlled dissolving releases some salt immediately, which insures quick salt replacement, but still not in sufficient quantities to cause nausea.

*The Formula used for producing "PEP-UP" Impregnated Salt Tablets was developed by the United States Naval Medical Research Institute. The tablets meet government specifications for Type III, Class C, impregnated salt tablets. (Specifications set forth in Federal Standard Stock Catalog No. SS-S-31c, Section IV (Part 5), dated January 22, 1948.)

I-5—"Expendable" Dispensers containing 500 ten grain Impregnated tablets..... **$1.20**

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THE PACKAGE IS THE DISPENSER

Tablets come to you in sanitary, factory-sealed Dispensers at no extra cost. THROW AWAY DISPENSER WHEN EMPTY. HANG UP A NEW ONE.

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gestions, and publicity.

b. Safety training programs, and general educational activities, such as job safety training, panel discussions, movies, posters, literature and bulletins.

c. Periodic physical examinations, first aid training, and fire drills.

Fourth Phase of Improvement

As expected, the results obtained for each additional unit of effort over three are becoming smaller and smaller, and five units of effort would seem to bring down the frequency rate from 4.0 to only 3.2. We were determined, however, that this new goal could be attained, and the additional field to which we would devote attention to achieve this end would be that of research and development, solving specific technical problems, redesigning machines, inventing new aids, relayout of production processes and many other engineering fields of a progressive nature. This is especially important at this facility which has so many pilot lines, and carries on experiments into new fields, which present hazards not too well known or standardized in national literature. At least a dozen examples of technical problems have been solved here for safety ends. We started on this road and the frequency dropped 25% toward the goal (to 3.8 for 1947) before shortage of experienced manpower and economies became severe enough to call a halt. In 1948, with our continued effort, the rating went down to 3.6, and since January, 1949, we have pushed it to 3.2.

It is recognized that many of the subjects and fields referred to would each require a separate article, and in some cases a book, to cover adequately. However, most of this has been done by other writers; and their analyses, together with solutions of the problems, have been presented from a variety of angles.

Suffice it to note in conclusion, that management can obtain what it wishes to pay for in the way of safety, and there is no problem which cannot be solved in this field by a qualified engineer. If a company's accident frequency is no better than "average," a lot of money is probably being wasted unnecessarily. Nearly any enterprise can cut the accident rate to one-half the national average and show a profit from an intelligent safety investment.

Pictures by courtesy of the Safety Branch, Frankford Arsenal.

Aids to Safety

See the Free

Bulletins & Catalogs

on page 64

CAN ASPHYXIA STRIKE WORKERS IN YOUR PLANT?

Crushing accidents . . . severe electrical shock . . . heart attacks . . . heat suffocation . . . monoxide poisoning . . . smoke suffocation . . . drowning . . . and other forms of asphyxia can strike down workers in your plant no matter what you make. Industrial experience has shown that accidents involving asphyxiation can occur despite the most carefully laid safety precautions. And when a worker stops breathing, time and death will not wait for haphazard rescue efforts.

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Carelessness Increases Fire Losses

POST-war carelessness and negligence" were largely responsible for the staggering fire loss of nearly two million dollars a day during 1948, J. M. Haines, president of the National Board of Fire Underwriters, stated at the 83rd annual meeting of the organization in the Hotel Commodore in New York.

He pointed out that fire insurance rates have remained practically unchanged in many states, even though "our companies have met the strain of losses heavier than ever before, coming at a time when costs of doing business have also continued to rise. Faced with conditions beyond its own making or control, the business has not only furnished the service and protection to policyholders that it guaranteed to deliver, but has also fulfilled its function in the national economy."

Despite these heavy losses and inflated costs, the fire insurance business earned a small underwriting profit during 1948, for the first time in five years, he said. He stated that the 1948 underwriting profit was approximately 4 per cent, contrasted with an underwriting loss of 5 per cent during 1947.

He called for greater effort to prevent fires through codes for safe building, fire prevention ordinances, and proper inspections.

"Catastrophes, tornadoes, earthquakes, and conflagrations have caused heavy property loss and have wiped out whole communities," he said, "but the continued improvement of the institution of capital stock fire insurance over the decades has spread the loss so that it has not fallen too heavily on the particular community or individual so afflicted.

"Such a record marks a new high in teamwork for public service made available through the National Board of Fire Underwriters. Its many activities for the common benefit, not only of the member companies but still more of all property owners in the land, afford the most impressive evidence of the extent to which the principles of cooperation is soundly applied in our business," he said.

"In no other way could a nation as large as the United States, with its increasing population and its varying fire hazards, have been properly and promptly served," he added.

Paints Reintroduced

PITTSBURGH Plate Glass Company's Bulletin Colors, a wartime casualty in the paint line, have been reintroduced, it was announced recently by E. D. Peck, general paint manager of the Company's merchandising division.

This line consists of 30 vivid colors approved by the Outdoor Advertising Association of America, Certificate No. 120. Features of the line, especially desired by sign painters, are their durability under trying weather conditions, their color permanence, their ability to set up quickly which minimizes dirt collection, their solid one-coat coverage, their non-bleeding qualities and their easy brushability.

The post-war Bulletin Color line, an improved formula, has undergone exhaustive field tests by experienced sign and bulletin painters in many sections of the country, it was stated.

Atomic Fires

(From page 21) lead poisoning. However, forgetting entirely about our plants for the moment, fire fighting is now fortunately advancing to the point where breathing apparatus is considered as standard equipment for fire fighters. As a matter of good practice, it should be worn when combating a fire in a uranium plant simply because it is a chemical plant, but *not* because of the uranium.

The element beryllium is a metal which may be used as a "moder-

ator" to slow down neutrons in nuclear reactions and has been used for some time in various industrial applications such as non-sparking tools. While not radioactive, it is now well accepted as being capable of causing acute and chronic lung disease of a serious nature. The Commission has reported to industrial hygiene groups the detailed results of its studies of beryllium poisoning. It is important to note that there are only a few major beryllium producing plants in the country and the problem is by no means universal. In case of fire, safe plant conditions may be upset since contamination by beryllium may be present to a high degree. As in any highly toxic atmospheres, fire fighters should wear breathing apparatus of the self-contained, demand or demand-work type in high concentrations of beryllium.

Waste Disposal

The general problem of industrial waste disposal takes on added significance in plants where liquid and solid wastes are radioactive. While wastes contaminated with short half-life materials do not present much of a problem, quite the contrary is true of those with long half-lives. Such wastes can be stored in remote areas, concentrated and mixed in concrete blocks to be dumped at sea, or disposed of in some other fashion. The possible contamination of ground and surface waters by such phenomenon as rainwater or dilute waste solutions is investigated by collecting and analyzing soil and water samples, and by studying water geology, rates of flow of streams, and so forth. As a result of such a study, measures are devised as a part of routine protection to reduce the degree or chance of contamination again to an extremely conservative tolerance level. The object is to have the contamination so low that waters and soils concerned cannot be distinguished from natural waters and soils which, as a point of information, contain measurable amounts of radioactive materials without producing any apparent harm. We hope that research will eventually succeed in showing that larger quantities of these materials can be added to water with safety so that waste treatment methods can be less elaborate. The only point to bear in mind relative to this subject as concerns operational fire fighting is our understandable desire to keep water run-off to a minimum. This requires effective fire fighting and good salvage operations. If excessive water run-off is unavoidable, monitoring will be in order. However, such an eventuality does not appear very probable.

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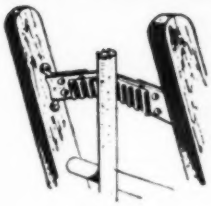

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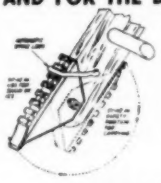

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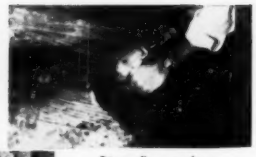
Pyrophoric Materials

Zirconium is a metal which we are handling in very limited quantities for research purposes. It deserves some consideration here because of an interesting fire property, namely the fact that it is pyrophoric. When we describe a material as being pyrophoric we mean that in finely divided form it may ignite spontaneously on exposure to air. Of course, there is no such spontaneous ignition when

3 steps, and you're safe



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the zirconium is in a solid form. It is when powdered that a hazard exists and the more finely divided the more pyrophoric the material becomes. It has a low ignition temperature and is the most readily ignitable of all metal powders. It is to be found at the head of the table of explosive dusts because of its extreme ease of ignition and very high flammability, although it produces lower pressures and rates of pressure rise than do a number of other metal dusts.

The fact that zirconium powder may explode as a result of the static charges generated when it is dispersed as a cloud in air is indicative of its ease of ignition. It becomes an explosive when in contact with oxidizing agents and dust clouds of zirconium have been ignited in pure carbon dioxide. I have read of one process wherein the grinding of zirconium turnings to a powder presented difficulties because the pyrophoric turnings detonated if pounded under water. Zirconium has a marked affinity for chlorine and is very sensitive to the gases of the atmosphere. In utilizing the powder, particle size should be as large as the process will permit, in order to decrease the hazard. It should be shipped in small quantities, either thoroughly wet with water to keep the metal below its ignition temperature or under an atmosphere of a noble gas such as argon. In handling zirconium obviously all sources of heat or spark should be eliminated. Tools should be of non-sparking material and it is advisable to handle the material wet or under an atmosphere of argon. The material should be stored in small separated quantities; after all, dispersion is generally the cheapest form of fire protection. If possible, fires should be allowed to burn out; if not, dry sand or approved commercial preparations for magnesium fires may be of some use. We must remember that zirconium, especially in the powdered form, is relatively scarce and will not be encountered very often or in large quantities.

Uranium powder is also pyrophoric, is quite active chemically and reacts with nitrogen, carbon, sulphur and the halogens at elevated temperatures. As in the case of zirconium, uranium dust clouds must be avoided. If the powders are exposed to the air and ignite, the metal is lost. In the case of the uranium such a loss must be avoided if at all possible for obvious

Flatless Vacations

WITH more of America's 33,000,000 motorists expected to "hit the road" this summer than ever before—many of them in overage vehicles, Claude R. Mason, tire service manager for B. F. Goodrich has listed 20 tips for a "flatless" vacation.

Although improvements such as the new tube and tubeless tire, both of which seal punctures on the revolving wheel, are coming into wider use, he said, the vast majority of car owners still will be rolling on standard tires and tubes.

To help motorists keep their vacations "flatless" and free from trouble, Mason listed the following 20 factors which can cause tires to fail or to wear out prematurely:

1. Improper inflation (over or under); 2. releasing air pressure from "hot" tires; 3. using oversize or undersize tires; 4. neglect of cuts, snags and bruises; 5. prolonged use of boots or blow-out patches; 6. fast starts and sudden stops; 7. scraping, bumping or driving over curbs; 8. excessive speed around curves and on straightaways; 9. driving on streetcar tracks; 10. running over rocks and other sharp objects; 11. parking on oily floors; 12. leaking, loose or uncapped valves; 13. use of inaccurate gauges; 14. infrequent checking of tire pressures; 15. worn, leaky or wrong-sized tubes; 16. improperly mounted tires and tubes; 17. failure to remove foreign objects from treads; 18. failure to cross-switch tires every 5000 miles; 19. use of wrong-size tire flaps, and 20. improper alignment of wheels.

reasons. Some of our processes involve the use of ether. The high volatility, very low boiling point, low autoignition temperature and wide explosive range contribute to the difficulty of extinguishing an ether fire and many common methods of extinguishment are ineffective. In order to obtain additional data on the control of such fires, our Office conducted tests in the latter part of 1948. In these tests, 500 gallons of ether were consumed and an effort was made to simulate the various types of fires that might be anticipated in the plants concerned, such as leaking packing glands, ruptured piping, discharge from open valves, leaking flanges and so forth. The most severe fire involved ether flowing under 20 pounds pressure from a serious flange leak in piping 8 feet above the ground. The ether was allowed to flow for 30 seconds, was ignited and allowed to burn 30 seconds before extinguishment was attempted. Such a fire involving ether burning in a pool on the ground and 8 feet in the air presents a severe fire fighting problem. This particular fire was extinguished with dry chemical; and after complete extinguishment, ether under pressure was still flowing from the flange. In actual practice of course the flowing ether would be shut off before extinguishment was completed. The agents utilized in the tests included variously carbon dioxide, low velocity water fog, high velocity water fog, carbon tetrachloride, regular liquid foam, alcohol type powdered foam and dry chemical. It was concluded that dry chemical was the most effective agent for ether fires within the range of extinguishers and that water fog had considerable ability to retard the spread of the fires, and to assist in preventing reflashes.

Emergency Programs

In accordance with proper practice in the chemical industry, we have developed emergency programs for our major plants and laboratories. These plans include the maintenance of close liaison with the municipal fire chiefs in locations where we are dependent upon the outside fire department. In plants under New York Operations Office, the fire chiefs are contacted and are escorted on a fire fighting survey. If this involves restricted areas, the chiefs of course must be given a clearance check prior to the visit.

It is obvious after reviewing some of our hazards and materials that fire fighters require guidance in the precautions to be observed in handling them. This in the main accounts for our interest in cooperating with municipal fire departments and with the Bureau of Explosives of the Association of American Railroads on railroad shipments.

In conclusion, even though atomic energy will see increasing use in our industrial picture in the coming years, it should not be any cause for alarm on *(To next page)*

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the air you breathe, that is...

when you wear a Dupor water-cooled Smoke Mask equipped with fog-proof, gas-tight goggles. For combined eye and lung protection of painters, foundrymen, smelters, oil refiners, chemists, firemen, etc. Sponge filter soaked in water keeps the air "clean as a whistle."

DUPOR SMOKE MASK
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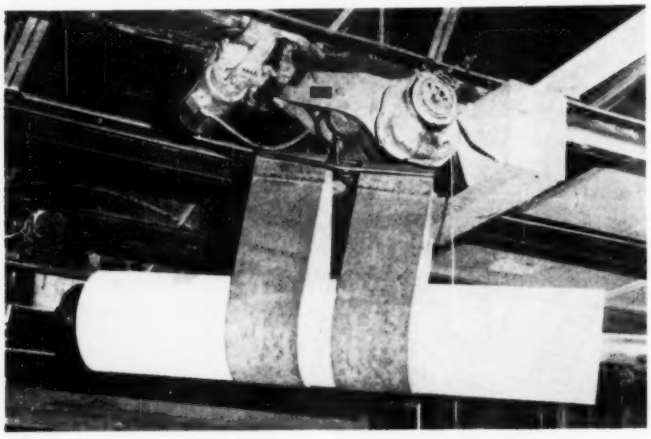
Keeps dust, fumes, paint spray out. Gives double filter protection. You get controlled breathing through patented Dupor valves. Panorama vision eliminates blind spots, allows for use of glasses or goggles.

For the best in eye protection get H. S. Cover's Gas-Tight, Fog-Proof Goggles...$1.65 pp.

H. S. COVER, SOUTH BEND, INDIANA

SAFETY ENGINEERING Salutes a Safety Idea for July



Hoisting Rolls

A novel twin-belt sling simplifies the safe hoisting of paper, textiles, rubber, and other rolled materials. Two sections of wide belting are secured at each end to specially formed sections of bar stock and fashioned into a hoisting sling which handles awkward rolls without the risk of their sliding out or swinging dangerously as they are transported. The sling is wrapped quickly around the roll as it lies in storage or in a machine, and is attached to a hoist hook for transportation through the air above machinery and supplies. Transporting overhead avoids obstacles which necessarily would be encountered if the roll was transported over the floor. The hoist used in this case is a five-ton variable speed motor-driven trolley type. It is mounted perpendicularly to the I-beam on which it travels. The operator controls lifting, lowering, and transverse motion by push-button controls. A metal chain supports the control box and takes all weight from the electrical cable. Notice in the photograph that all three overhead I-beams shown are equipped for hoist operations. At the extreme left a portion of another hoist can be seen. These adequate hoisting facilities provide for quick and efficient handling and make use of oft-wasted overhead space, or "air rights."

Picture by courtesy of The Yale & Towne Manufacturing Co., Philadelphia Division.

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Atomic Fires

(From page 45) the part of the fire protection engineering profession. Some materials do present unique problems and yet they are all being handled safely. While the industrial implications of atomic energy are still on the horizon for most of us, they are successfully being handled right now by some of us. We who are responsible for safety and fire protection in the Commission are pleased with our safety record and low fire loss ratio and the fact that Oak Ridge has won first place in the National Fire Prevention Week contest two years in a row. Atomic energy is a new field with many unsolved problems, but everything points to our being able to live with it and use it safely.

From an address presented at the 53rd Annual Meeting of the National Fire Protection Association.

Safety Award to Binks Mfg. Co.

ONE million man-hours work time without a disabling injury in the entire period. This enviable record has been achieved by the Binks Manufacturing Company of Chicago. An appropriate plaque commemorating the event was presented to Burke B. Roche, president of Binks, by W. D. Keefer of the Lumberman's Mutual Casualty Company. Presentation of the award was made at a gala dinner in the Midwest Athletic Club of Chicago recently. According to records of the National Safety Council, only 6 out of 1,000 industrial plants in the country are able to operate one million man-hours without a lost-time accident. Only by strict adherence to established safety rules is this record approachable.

In the case of Binks, who manufactures precision spray painting equipment, more than average safety vigilance was required. A co-ordinated safety program was established and enforced through the direction of the shop foremen.

Mechanized Foundries

FACED with high production costs and with labor's growing dislike for arduous, unpleasant jobs, American foundries must mechanize and modernize in order to compete successfully with other metal working industries. This advice for lightening the traditional back-breaking job of the foundryman was given recently by Frank R. Elliot, foundry superintendent of the Westinghouse Electric Corporation's appliance plant at East Springfield, Mass., before the spring meeting of the American Society of Mechanical Engineers at New London, Conn.

"If the foundry of today is to compete for work and for labor with the metal working industries," Mr. Elliot declared, "I believe it is necessary to take advantage of every available means for reducing expense and effort.

"Good management and good methods and good material handling equipment offer the only solution," he said.

Pointing out that handling and re-handling of materials constitutes 50 per cent of the cost of making small grey iron castings in the average production foundry, Mr. Elliot described many new techniques recently introduced for mechanizing foundry operations. Conveyorizing the Westinghouse foundry has eliminated the manual lifting of 22 tons a day by each molder, and at the same time has boosted each worker's productivity by more than 50 per cent. In addition, the conveyors "apparently" solved the problem of getting people to work in the foundry.

In addition to the 450 feet of conveyors installed at the foundry that Mr. Elliot supervises, the recently completed $1,250,000 modernization program there included replacing more than a dozen rigorous hand operations by mechanical, automatic and push-button devices, and the installation of a new ventilation and dust removal system.

Total weight formerly handled every day by the foundry's 75 employees was 1,470 tons. Today, it's only 294 tons. Top weight of 65 tons each was formerly handled by a group of five "shake out" operators—men who remove the sand and castings from the poured molds. Today their operation is completely mechanized.

Among the various labor and cost-saving techniques that some foundries have instituted recently, Mr. Elliot described: use of automatically-controlled skip hoists in place of charging crane; mechanical charging; storage of miscellaneous materials on pallets; gasoline-powered industrial trucks with scoops or forks; hand lift trucks; use of skids made of the ingot material for moving bundles of ingots; in the molding equipment, mechanical equipment for handling the pouring weights and jackets from mold to mold; conveyors for all stages in molding process; and mechanical sand handling equipment.

Urban Fires in 1948

A NEW survey reveals that there were 802,545 urban fires in the United States during 1948, the National Board of Fire Underwriters reported recently

The survey, made by the National Board's Committee on Statistics and Origin of Fires, indicated that 388,935 of these fires were in buildings, while 413,610 were non-building fires, including grass and brush fires. This represents an increase of 7.8 per cent in building fires and 5.7 per cent in non-building fires over 1947.

The totals were compiled on the basis of questionnaires answered by 1,954 fire chiefs in towns and cities of 2,500 population or more. The survey did not include rural areas.

The survey indicated a slight drop in the number of fires in "manufacturing" occupancies, while the number of "storage" fires increased by 11.8 per cent, "residential" fires by 8.8 per cent, and "mercantile" fires by 6.1 per cent.

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THE Future SHOWS

Portland, Ore.

Eleventh Annual Western Safety Conference, June 26–29. (Multnomah Hotel) Frank E. Landsburg, conference president, Pittock Bldg., Portland, Ore.

Cleveland, Ohio

Eleventh Annual Ohio State Safety Conference and Exhibit, Sept. 20–22. (Carter Hotel). Carl L. Smith, secretary-treasurer, 2073 East 9th St., Cleveland 15, Ohio.

Chicago, Ill.

Thirty-seventh Annual National Safety Congress and Exposition, (Stevens Hotel), Oct. 24–28. R. L. Forney, General Secretary, National Safety Council, 20 N. Wacker Dr., Chicago 6, Ill.

New York, N. Y.

Seventy-seventh Annual Meeting American Public Health Association, October 24–28. (Hotels Statler and New Yorker). Dr. Reginald M. Atwater, executive secretary, 1790 Broadway, New York 19, N. Y.

Shreveport, La.

Ark-La-Tex Annual Industrial Safety Conference, Nov. 3, Charles E. Doerler, managing director, P.O. Box 806, Shreveport, La.

Havana, Cuba

World's First Inter-American Safety Congress and Exposition, Nov. 14–17. (Nacional Hotel) Sponsored by Inter-American Safety Council, 2 Rector St., New York 6, N. Y., Capt. J. N. Parrott, executive director.

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Machine Speeds and Operator's Capacity

THOUGH industry is using an increasing number of machines whose speeds are controlled by the operator's capacity, rather than by the machine's, little or no consideration is being given to the operator's capability when machine speeds are set, D. G. Malcolm of the University of California Mechanical Engineering Department stated at the Semi-Annual Meeting of The American Society of Mechanical Engineers in San Francisco.

"The speeds of operator-fed machines ought to be adjustable," he said at ASME meeting headquarters in the University of California Extension Building, "and if possible, set at the speed which will allow each operator to perform at his optimum rate."

Mr. Malcolm recently tested the effect of machine speed on the performance of operators and said he felt similar tests could be helpful in industry for determining the proper machine speeds. On the basis of the laboratory research he conducted, Mr. Malcolm drew these conclusions:

First, the operator's subjective feeling concerning his production rate is misleading as an estimate of his actual production rate. Second, the "production versus machine speed curves" for all operators are similar, showing a gradual leveling off of production as speed is increased, a peak and finally a sharp drop.

And third, all operators but two reached peak production when their machines were operating at approximately the same speed. The two who lagged, Mr. Malcolm explained, had difficulty training their left hands. This suggests that the variation in speeds at which maximum production is reached would be much smaller with operators more fully trained than the students used in the experiment, he said.

Suggestions for Industry

Assuming that the principles brought to light in the experiment are valid in the industrial situation, Mr. Malcolm said he had a few things to suggest to industry.

"Whenever the machine's speed is determined by the operator, school him in the fact that his total production will continue to rise as he increases the machine speed even though he misses more opportunities and feels that he is producing a smaller amount," he said. "This is necessary because too often his subjective feeling will cause him to settle for a speed below his optimum. If a piece-rate wage incentive is used, this new approach should not be hard to prove to the operator."

When a supervisor is responsible for setting the machine speeds, Mr.

Malcolm suggested that experiments be made to determine the speed at which each operator can produce the most. The maximum production speeds very likely will be quite similar, he said, but each machine still should be set at the individual operator's optimum speed.

"When machines of this type are not adjustable, it would be wise to have machine designers incorporate the adjustable feature," Mr. Malcolm said. "Each operator should have the opportunity to adjust the machine he is working at to his optimum speed. Allowance should be made for individual differences that exist in the workers who operate production machinery."

Florida Weather-Testing by N. Y. Laboratory

AN OUT-OF-DOORS testing station in Miami, Florida provides the maximum of exposure to the sun's rays for weather testing of materials and products. Arrangements have been made by Sam Tour & Co., Inc., 44 Trinity Place, New York for such testing service.

This firm of metallurgists, engineers and consultants makes use of these Southern Florida facilities because cloud interference is at the minimum. This permits the maximum of actual exposure to rain, wind and salt water as well as to intense sunshine and makes it possible to conduct weather exposure tests on a year round basis.

At their laboratories in New York City facilities are maintained for both outside and inside weather testing. Outside testing racks are set up on the roof of their building while in the laboratory simulated weather conditions are secured by up-to-date equipment.

Interpretation of reports on all weather tests are made by the engineering staff in the laboratories in New York. Materials and products tested, vary widely. Amongst them are paints, enamels, surface coatings of metals, plastic materials, etc.

Accidents Are Expensive

HALF the cost of running the State government in California for one year could be paid for, if all industrial accidents in California were eliminated, according to the calculations released by the Department of Industrial Relations in a recent issue of the California Safety News.

Hypothetically, $450,000,000 could be saved, the Department reveals, if all industries initiated safety programs and gave safety the same thought and planning that ordinarily went into production, engineering and sales programs.

Over 500,000 industrial accidents were recorded in 1948, and of these, 141,528 were disabling injuries and 649 were fatal. The "California Safety News" points out that these statistics are startling just from the humanitarian angle, but beyond that, the financial cost is tremendous. The huge sum of $222,830,000 in direct costs was lost according to the computations of the Department. If to these costs were added the values of damaged machinery, equipment and materials, the full loss would total four or five times the direct costs of compensation and medical care.

According to the "California Safety News" a reduction of 20% in unit costs is possible. If California could reach a Utopian condition where all industrial accidents were eliminated, then the State by saving even 5% on its production costs could figure a profit of $450,000,000, a sum that would go a long way towards increasing the economic stability of industry in the State.

Don't Overlook the Free Bulletins & Catalogs

See page 64

Hot Mold Handlers

mitts

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We built these one finger mitts especially for handling hot molds, and a lot more hot things too. We make them from horsehide split . . . no other leather can stand the gaff so well. And on hot jobs, this specially tanned horsehide is far less likely to harden, shrink and split. *These mitts LAST.*

At the same time, they're flexible, comfortable to wear, don't have to be broken in. The wool lining keeps out heat, keeps hands cool. Jumbo size makes them easy to put on, take off, gives hands plenty of ventilation. Palm seam and heel of hand have extra reinforcement.

They are well made one finger mitts. Manufactured with 2 inch cuff (No. 14883), 4 inch gauntlet (No. 14730), 6 inch gauntlet (No. 14844). Also available in glove and mitten styles. Sizes for both men and women.

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New Breathing Apparatus

Lee Crane (left) of the Industrial Relations Dept., Spang Chalfant Division, The National Supply Co., Ambridge, adjusts a new type oxygen breathing apparatus on Sgt. William Bofinger of the Ambridge plant protection force. Equipment is for rescue work in smoky or gas-filled areas.

THE Safety Department at the Ambridge plant of Spang Chalfant Division of The National Supply Company has just added two new-type oxygen breathing apparatus to its supply of protective and rescue equipment.

Developed during the war for the Navy, the apparatus had been classified as a military secret until it was made available for fire departments and industry by the manufacturer.*

Used for rescue work in smoky or gas-filled areas, the apparatus is the only respiratory protective equipment that generates its own supply of oxygen. Weighing only 13 pounds, the equipment has no high pressure cylinders, valves or fittings.

Oxygen is generated by chemicals in a canister through the reaction of the wearer's exhalations. No outside air is needed. At least 45 minutes of protection is given by the apparatus and an automatic timing device warns the wearer when to return to fresh air.

Lee Crane of Spang Chalfant's Industrial Relations Department explained that the apparatus will be used by members of the plant's Police and Fire Departments who have been trained in operating them and who are on duty continuously.

* The name of the manufacturer can be obtained from the Editor.

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Brandt Directs EITA

WILLIAM VAN C. BRANDT, of Philadelphia, one of the pioneers in the battery-powered industrial truck industry, has been appointed managing director of the Electric Industrial Truck Association. He assumed his new duties July 1. Active in the EITA for the past 25 years, Mr. Brandt has resigned his position as manager of Railway and Motive Power Sales for The Electric Storage Battery Company of Philadelphia to accept the new post. He succeeds C. F. Kells, who left EITA to join a publishing firm.

Succeeding Mr. Brandt as vice president of EITA is M. W. Heinritz, vice president of Gould Storage Battery Corporation, Trenton, N. J.

Mr. Brandt has been associated with The Electric Storage Battery Company since 1912. He has been active in the battery-powered industrial truck industry almost since the first battery-powered truck was built. A native of Wilmington, N. C., he attended the U. S. Naval Academy in Annapolis with the Class of 1911. The following year he joined The Electric Storage Battery Company, first as a sales engineer and later as manager of the Pittsburgh branch. He is a former member of the National Board of Trustees of The Naval Academy Alumni Association and is presently serving as a director of The Naval Academy Alumni Association of Philadelphia. He is a past commander of the Houston post, American Legion, at Germantown, Pa.

Mr. Brandt has been continuously associated with The Electric Storage Battery Company, except while on two military leaves of absence. He won distinction and battle stars in both World Wars. In World War I he served as a Naval Reserve officer in submarine service and transport duty. Mr. Brandt returned to the Navy as a Lieutenant Commander, U. S. N. R. in World War II, commanding the U. S. S. Dover and later, as a Commander, captained the U. S. S. Sanctuary.

Guardian Safety Equip. Co.

GUARDIAN Safety Equipment Company has announced the opening of a new office at 50 Hawthorne Street, San Francisco, California. Mr. John W. Dee, President, will personally take charge of the new Northern California Guardian Office.

Mr. C. B. Merskoetter has been added to the staff of the Guardian Los Angeles Office. Mr. Merskoetter has been active for nearly three years and is well known in the Southern California Safety Equipment field, having been previously associated with the Charles E. Morton Company.

Annual Meeting of Underwriters' Laboratories

UNDERWRITERS' Laboratories, Inc. held its annual meeting at the National Board of Fire Underwriters' Building in New York City. All the Trustees and Officers of this not-for-profit corporation were re-elected.

The President, Curtis R. Welborn, reported:

> "Little of the spectacular is in the application of science and engineering to the prevention of accidents and crime and the conservation of life and created wealth. The principle, 'State the Facts,' to which this enterprise is dedicated, continues a contribution to the national welfare and economy, as is evidenced by increasing public acceptance of its technical findings and by industry's support. This acceptance and support are gratifying and inspiring."

The review of 1948's affairs shows a decrease in over-all label volume of 12 per cent from the all-time peak reached in 1947. The 1948 volume was, however, 30 per cent above the prewar peak of 1941.

New Products Submitted

The Engineering Departments reported continued high levels in the numbers of products submitted to them for examination and test. Several submittals brought up new problems to the Engineering Staff because of their unique design or because they opened new type classifications.

Included in these categories were a "Composite Fire Door" and a trailer coach submitted to the Protection Department. The fire door was unusual in that it did not rely upon metal for fire-resistant qualities. The intent of the trailer coach investigation was to reduce the fire hazard inherent in small, compact living quarters; consideration was not given to vehicular features of the coach.

The Electrical Department reported an innovation in the television field. It was a picture tube which combined metal and glass in the construction of the outer shell.

The Chemical Department received submittal of some special products for use in hazardous locations such as combustible gas detectors, a telemetering system for transmitting instrument measurements to remote locations, and candy factory molding starch treated to reduce explosion hazards.

An automatic heating assembly designed for use with both gas and fuel oil, an apparatus for accelerating the smoking of meat by mixing wood smoke and warm air, and an "Insecticidal Fog Applicator" for the control of insects were submitted to the Gases and Oils Department.

The Hydraulic Department completed the investigation of fire protection of fur storage vaults by automatically operated carbon dioxide systems. This study was sponsored by the industry's Fact-Finding Committee and was released in the form of a printed report.

In telling the story of the Laboratories' work during 1948, 73 addresses were made by Staff members to approximately 7,500 persons. The film "Approved by the Underwriters" was shown to 1,400 audiences totaling 175,000 people. Feature articles on the Laboratories' work appeared in eight national magazines during the year.

Traffic Safety Movie

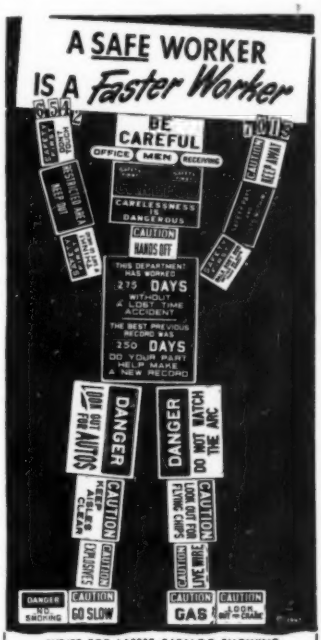
A NEW sound and color motion picture, designed especially for traffic safety education in public school systems, has just been completed by The Atlantic Refining Company, Philadelphia. Entitled "A Plan for Safety," the premiere showing of the film was held in Camden, New Jersey.

Filmed under the supervision of the Bureau of Traffic Safety Education of The Atlantic Refining Company and produced by News Reel Laboratory, Philadelphia, the picture tells the actual story of the development and operation of a plan used for many years to combat traffic accidents among the school children in Camden, N. J.

Fifteen years ago the Mayor and city officials of Camden adopted such a program to reduce the mounting number of traffic accidents and assigned two traffic officers full time to the project. The film depicts the vital steps taken to make this plan a success, the creation of safety patrols, safety clubs, the organization of traffic safety courts conducted by the children themselves and awards contributed by city business men for outstanding records.

The picture further commends the officials of the City of Camden for this remarkable achievement. During the past fourteen years, there has been only one traffic fatality in the public school system as a result of this plan.

As a public service, the Bureau



of Traffic Safety Education of The Atlantic Refining Company is making this picture record available to other municipalities, boroughs, schools, service clubs and civic organizations.

The film is 16 mm. and may be procured from the Film Lending Library of The Atlantic Refining Company, 260 South Broad St., Philadelphia.

Protection for Pilots

TO PROTECT pilots against the effects of carbon dioxide concentrations that may form in the forward compartments of its DC-4 Capitaliners during operation of the nose heater fire extinguishing system, Capital Airlines has equipped these aircraft with emergency, demand-type oxygen masks.

The equipment has a dual purpose: to supply oxygen to the pilot and co-pilot for respiratory protection and to protect their eyes from the irritating effects of high concentrations of CO_2. The apparatus utilizes the same principles developed for the Armed Forces by Mine Safety Appliances Company for high altitude flying.

Each of the two all-vision face masks is carried in the forward compartment of the plane in a quick-opening canvas container mounted on the bulkhead behind each seat. Oxygen outlets are installed in the control panel within easy reach. These are quick disconnect and automatic shut-off type fittings. The pilots merely plug into them the male fitting connected to the demand regulator. Oxygen flow then is activated by inhalation of the wearer.

The gas mask type facepiece is connected to the single-stage demand regulator by a 30-in. flexible rubber breathing tube. Of molded rubber, the facepiece quickly adjusts to an air-tight fit on the wearer to keep out CO_2 which in high concentrations is harmful to the eyes. Fogging of the lenses is prevented by the sweep of cool, dry oxygen across them.

Medical authorities say that CO_2 in concentrations of more than 12 percent is a depressant, causing an individual to lapse into stupefaction. Sometimes it can be fatal. When CO_2 is released to extinguish a fire in the belly compartment of a plane, it can infiltrate into the pilots' compartment. Pilots have been instructed to don the masks before releasing the CO_2 fire control valve.

The emergency apparatus is entirely independent of the aircraft's standard oxygen equipment. The latter is a constant flow system that blends oxygen with the air inside the plane. It cannot be effectively used, therefore, when the cabin contains CO_2.

One 38.4-cubic-foot capacity oxygen cylinder supplies the emergency system. It is located in the oxygen tank rack behind the forward bulkhead in the aircraft. This cylinder is equipped with a 50-lb-per-sq.-in. reducing valve and the lines leading to the outlet fittings are under pressure at all times. The demand regulator automatically delivers to the pilot the proper flow of oxygen on each inhalation. As the wearer inhales, the negative pressure created draws in the diaphragm of the regulator valve. This activates a series of levers that admit oxygen from the valve chamber into the breathing tube leading to the facepiece. When the pilot exhales, the oxygen flow stops.

Besides the fixed system, there also is available a portable unit that operates on the same principle but enables the wearer to walk around. With this unit, the wearer carries an oxygen tank suspended in front of him by shoulder straps.

Merrill Brothers Open New Sales Outlets

IN KEEPING with the earlier announced program of expanding all sales activities of Merrill Brothers, Maspeth, N. Y., Manufacturers of Drop Forgings and Materials Lifting Devices, Howard L. Franks, Director of Company Sales announces the appointment of four more highly reputable organizations in the capacity of sales representatives. Territorial coverage will be as follows:—

The George A. Allen Co., 9 So. Clinton St., Chicago 6, Illinois. Will cover Chicago, and the states of Illinois, Missouri and Kansas.

The C. B. Lawrence Co., 740 Superior Ave. N. W., Cleveland, Ohio. Will cover Ohio, Michigan and Indiana.

Mr. Henry R. Hansen, 330 Downing St., Denver 3, Colorado. Will cover Colorado, Wyoming, Utah and New Mexico.

Val. W. Ove Metal Products Co., 1348 No. 37th St., Milwaukee 8, Wisconsin. Will cover Wisconsin, Michigan Peninsula, Minnesota, Iowa and Omaha.

These concerns, well known in their respective localities and supported by a heavier than usual advertising and sales promotion program, will have full responsibility in acquainting all industrial concerns and distributors in their area with the MERRILL BROTHERS products.

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industrial Hygiene

ASSOCIATE EDITOR
JACOB A. GOLDBERG, A.M., Ph.D.

When the Heat Is On

Some Tips on How to Beat the Heat

IT MAY be something of a comfort to those sweltering in mid-summer heat to know that the human body can take it when the heat is on. This fact doesn't mean that one should blithely ignore the possibilities of over-exertion and heat prostration, but it does mean that, no matter how imminent it may seem, your blood is not going to start boiling. The air force, worried about what might happen to pilots in the excessive heat generated by the air-friction of supersonic planes, recently made some tests to find out how much heat the body can withstand. The human guinea pigs were subjected to extremely high temperatures, but it was found that the body temperature was affected hardly at all.

Even though these tests show that the human body is able to keep a stable temperature, no one is likely to envy the pilots who underwent this superheating. In fact, most of us are ready to curse the heat when temperatures rise over 79, a reaction against the discomfort which the average person feels at such a temperature.

A reinforced cellulose sweatband, mounted on an all-rubber headband, is self-adjusting and light in weight. Sponge material keeps sweat from eyes.

How the Body Keeps Cool

The body has its own automatic thermostat for maintaining a constant body temperature, but in terms of comfort we can do a great deal to help the process by means of diet, clothing, personal hygiene and cool common sense. The principal methods by which the body keeps cool are by convection (the transfer of heat to the clothing) and evaporation (the loss of heat when perspiration dries).

Soap and deodorant advertising to the contrary, sweating is no shame. It may be a nuisance, but it certainly is a wholesome, natural and even necessary activity. Furthermore, when air temperatures approach 98, it is difficult for heat to be lost by convection because the clothing and the body are then at the same temperature. As a result, the body must increasingly rely at higher temperatures on the evaporation of sweat for its self-cooling.

Sweating Out What?

In a sense, sweating is an emergency measure which helps the body get through a temperature crisis. Like all emergency measures, however, it has put an

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added strain on the body, or in other words, made the body give more of itself than is normal. It has depleted the normal amount of water in the body and also the normal amount of salt. It is little wonder, then, that even sedentary workers feel limp and let down when the temperature goes up and that more active workers not only feel exhausted but also suffer from heat cramps and nausea.

The problem for everyone, and especially the industrial worker, is to remember that excessive sweating is an emergency measure. To maintain the proper amount of water and salt in the body, the individual should drink more water and take extra salt. For physically active workers, salt tablets are a convenient way of resupplying the body's quota of sodium chloride. The salt tablets should be followed by an ample drink of water—cool but not cold. Other important considerations in preventing heat fatigue are to wash frequently, get plenty of sleep and don't over-eat.

Sweat As a Hazard

To some people, sweating is a social hazard; to many workers, it is an occupational hazard. Many industrial operations are basically dangerous and require the constant alertness of the employee. Not only is the excessively perspiring worker uncomfortable, groggy, and distracted by his very discomfort, he is also likely to be bothered by the actual presence of dripping sweat, specially around his face. Perspiration runs from his forehead into his eyes; the eyes smart and he may be momentarily blinded; dirt and dust particles carried along by the moisture increase the irritation; attempts to wipe off the excess sweat with his arm, sleeve, or a rag may only increase the grime; goggles and other protective equipment may fog more easily. All in all, the worker is sweating himself into inefficiency and, worse still, into an accident.

For reasons of comfort, safety, hygiene and morale, workers should be encouraged to wear sweatbands. These are strips of an absorbent sponge material capable of gathering excess moisture and holding it. Worn across the forehead, the light-weight bands catch the sweat and keep it from running into the eyes. They are particularly useful in steel mills, chemical plants, welding operations and other areas where temperatures are excessive, but there is hardly a plant that could not make good use of these sweatbands during the hot summer months.

The heat may be on, but no one needs to be down or out because of it. If the worker remembers that sweating is an emergency measure and if he himself takes appropriate emergency measures to counteract it, he will be safe and, even if not wholly, at least relatively comfortable.

Picture by courtesy of the American Allsafe Co., Inc.

Safer Crane Cabs

THE air conditioning of crane cabs to improve working conditions for cranemen, often the "forgotten man" in the industrial scene, is outlined in an engineering bulletin issued by Industrial Hygiene Foundation to its member companies.

The bulletin, covering the removal of irritating dust, fumes and gases, to which crane operators are often exposed, as well as alleviation of heat at cab level, was prepared by B. R. Small, an engineer of the Aluminum Company of America and a member of the Foundation's Preventive Engineering Committee. The Foundation, with headquarters at Mellon Institute, is a nonprofit research association of industries for advancing employee health and improving working conditions. The improvements suggested by Mr. Small follow:

1. An enclosure for the operator, designed to protect him from heat, fumes, dust, or gases. This can be accomplished by totally enclosing existing cabs, by mounting prefabricated cabs on existing structures, or by the purchase of a standardized cab, either rectangular or rounded, built for these special conditions.

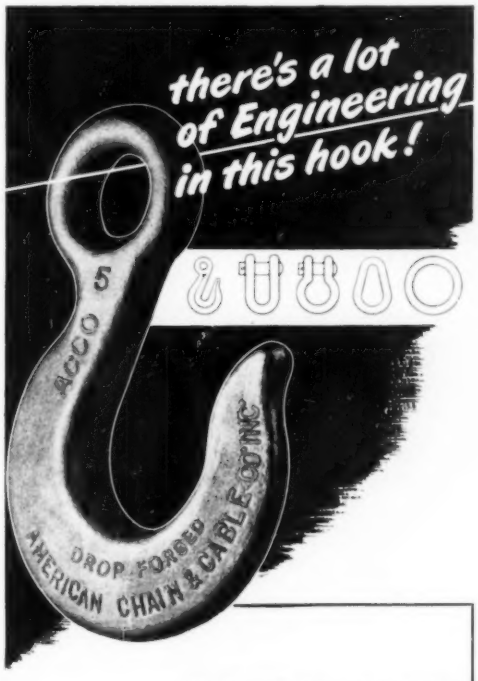
2. A cooling mechanism located on the overhead bridge walkway or on a modified cab structure. The mechanism may employ mechanical refrigeration or evaporative cooling.

Complete Cabs

As an optional feature, a set of new controls is advocated, permitting the operator to be seated and thus encouraging safer crane operating practice, and designed to reduce crane maintenance. When enclosing the existing cab platform, consideration must be given to the accessibility of window exteriors so they can be cleaned periodically.

Better, in Mr. Small's opinion, is the purchase of a new, full-sized rectangular cab, fully insulated and complete with hangers. Wide vision coverage for areas directly below the cab can be obtained by a projecting —or built-out—window section on the front and on the hook side. Night glare from overhead lights is less when the short leg of the projection window is at the top rather than the bottom. A rounded cab with new controls as an integral part of the unit is now available which embodies many improvements heretofore neglected. Vision almost directly below the cab is good even when the operator is seated.

After describing the types of cab enclosures recommended, the report lists the requirements of cab conditioning, such as the degree of cooling, the kind of conditioner, and the amount of air purification necessary. A chapter is devoted to mechanical refrigeration units and another to evaporative cooling. Copies are available at the Industrial Hygiene Foundation in Pittsburgh.



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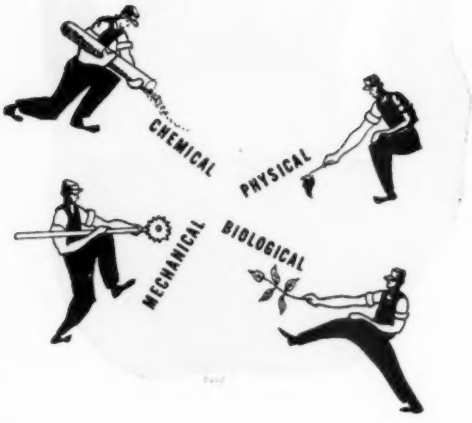

By
Louis Schwartz, Medical Director (Ret.)
and
Donald J. Birmingham, Surgeon *

OCCUPATIONAL dermatitis can affect any worker in any occupation. Fortunately, all workers do not contract an occupational skin disease, but each year more than 1% of all workers in general will develop an eruption as a direct or indirect result of their livelihood. Indeed, in certain industries, as high as 10–15% of the workers become affected with dermatitis due to their work.

The most important cause of an occupational skin disease is the material with which a workman comes into contact during the course of his work. This is usually termed the "actual" or the "direct" cause. In addition to the direct cause, other factors may be present which contribute to the production of an occupational skin disease. These factors are certain predispositions which make a worker less able to withstand the action of external irritants upon the skin. They are commonly termed the "predisposing" or the "contributory" causes.

How the Skin Protects

Nature provided our bodies with a covering (skin) designed to serve many purposes. One of the paramount purposes is to form a defense against the action of external irritants. This is accomplished by the horny cells, called the horny layer, the secretions of the skin glands and the pigment, all of which are contained within the outer portion of the skin.

The horny cells form a scale-like covering over the other layers of skin and are the first barrier of defense. These cells resist the action of water, fairly strong acids, and some of the solvents; however, they are vulnerable to strong alkalies and the prolonged action of mild alkalies.

Skin secretions are principally water, liquid waxes and fats. The water or perspiration may aid in removing irritants; but on the other hand, in some instances it may assist a solid irritant by putting it into solution, thus enabling it to attack the skin which it would not do when in powdered or solid form. The fats and oils aid in keeping the skin soft and pliable. In addition, these materials serve to repel and resist the action of water-soluble irritants.

Skin pigment termed melanin and the epithelium provide the barrier against the action of sunlight.

Along with the above protective attributes, the skin also has multiple openings which are the ducts of the sweat and oil glands and from some of these openings the hairs emerge. The pores are the openings into the skin and therefore are the vulnerable sites of skin. Certain materials can enter and irritate these openings without injuring the horny layer of the skin.

Factors Affecting Dermatitis

Notwithstanding the above protective mechanisms, many workers have certain anatomical and habitual predispositions which aid and abet the action of external irritants. These predisposing factors are represented by the following classes:

Race: It has often been stated that the dark skin of the Negro is better able to withstand the action of irritants. This is not entirely true because the Negro skin is just as susceptible to the action of strong alkalies and volatile solvents as is the normal light skin. It is true, however, that dark-skinned individuals are better able to withstand the action of sunlight, tar, and tar products with less effect than the white person.

* Clinical Investigations Branch, Division of Industrial Hygiene, Public Health Service, Federal Security Agency.

Occupational Dermatitis

What hereditary and environmental factors affect skin irritation?

Is there any connection between allergies and dermatitis?

How can a doctor distinguish between a "primary irritant" and a "sensitizer" ?

What are the actual causes of occupational dermatitis?

The dark, oily, swarthy, and hairy skins of the Mediterranean and Balkan areas are more likely to withstand the action of solvents than are lighter skins, but they are more prone to develop folliculitis and acne. On the other hand, blond workers are less able to work with solvents or withstand sunlight than dark, oily-skinned workers.

Age: Acute occupational dermatitis frequently occurs among young and new workers. The eruption usually occurs during the first few weeks of work and is most probably due to the lack of skill in avoiding prolonged contact with irritants handled on the job. In addition, young workers often do not learn to respect an industrial irritant until it has caused them some trouble. Older workers, on the other hand, may develop chronic types of dermatitis, probably because their skin defense mechanisms described above have become less active. Thinning of the skin and production of less skin fat are normal accompaniments of increasing age.

Sex: Because most women are more fastidious than men, they do not develop severe occupational skin disease as often as do men. Women are more prone to report an ailment and seek treatment at an early stage of injury, whereas many men are not seen by the physician until they have given up with "home remedies." It is also probable that less women are employed in the handling of powerful irritants than are men.

Perspiration: Although perspiration is a means of evacuating body waste, it can also help to produce a dermatitis. Marked perspiration tends to macerate the skin especially in the armpits, under the breasts, around the neck, around the belt line, and in the groins. These areas when macerated are more likely to develop an occupational dermatitis especially when industrially soiled clothing is worn. Perspiration can help to wash away an irritant, but it can also place certain materials into harmful solutions which otherwise would be harmless. This happens when dry lime is acted upon by perspiration to become calcium hydroxide, which can burn and ulcerate the skin.

Season: More occupational dermatitis is noted during the warm months because workers dislike protective clothing in hot weather. In order to remain comfortable, shirts are often removed thus permitting much contact with irritants. The heat further assists in creating marked perspiration which can be an additional hazard of itself. In cold weather, however, the extra clothing workers wear to keep warm also serves in a protective capacity.

Uncleanliness: No other factor is more important in the development of dermatitis than is uncleanliness. The dirty worker has more chance to develop an eruption because he allows the irritant to prolong its contact with skin. Soiled clothing worn day after day provides an excellent source of contact, and when taken home has even been known to affect other members of the family.

Unclean workrooms add further industrial hazards, and when present, offer little encouragement to the workman to keep his machine or himself clean.

Presence of Skin Disease: There are certain skin diseases which can become widespread when assisted by certain industrial irritants. These workers are better risks when placed in duties not requiring contact with irritants. People with a skin disease characterized by excessive dryness will soon develop an occupational eruption if made to work with solvents. Employees with acne are likely to have their skin condition be-

FEATURE

This is the third of a series of three major articles on Skin Protection. The first two articles of the series, dealing with skin cleansers and protective creams, were published in the May and June issues respectively.

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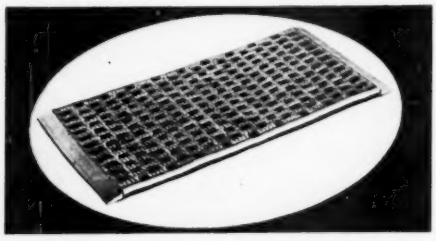

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come worse if their duties require contact with mineral oils. On the other hand, an allergic person is not necessarily a poor risk unless he is going to be exposed to the material which is the cause of his allergy. Furthermore, we do not believe that one allergy creates many allergies. If such were true, allergic persons could not work in the majority of our industries because there is scarcely a substance in industry which cannot act as an allergy producer to some individuals. It must not be forgotten that many of us have one allergy but only a few of us have many allergies.

It is estimated that allergic occupational dermatitis accounts for only about 20% of all industrial skin disease.

Though the above factors are truly significant when we speak of why occupational dermatoses occur, they are actually of secondary import because the most prominent factor in producing a case of occupational dermatitis is the *direct cause*. For purposes of classification, direct causes may be listed as chemical, mechanical, physical and biological.

Chemical Causes of Dermatitis

More cases of occupational dermatitis arise as a result of contact with chemicals than for any other cause. Because of the nature of the action of chemicals upon the skin, they have been classified as (1) primary irritants and (2) sensitizers of organic or inorganic nature.

PRIMARY IRRITANT: A primary irritant is one which causes dermatitis by direct action on the skin at the site of contact, if permitted to act in sufficient concentration for a sufficient length of time. A primary irritant may also act as a sensitizer. Materials which are primary irritants produce this effect by certain chemical action upon the skin, i.e.:

Keratin Solvents: Alkali, soaps and sulfides dissolve the keratin or horny layer and thus remove the first barrier of protection and make the skin more vulnerable to the action of a chemical.

Fat Solvents: Solvents such as turpentine, kerosene, carbon tetrachloride, and others, dissolve the skin fat which leads to a dry and cracked skin.

Dehydrators: Inorganic acids such as sulfuric and nitric acids and also the anhydrides damage the skin by removing water from it.

Protein Precipitants: Heavy metals such as chrome, mercury and their salts tend to precipitate the protein in the skin to actually form new chemical compounds within the skin. This is what takes place in the tanning of leather.

Oxidizers: Oxidation agents such as bleaches and per salts are chemically reactive upon the skin.

Reducers: Some organic acids and sulfides which soften keratin can affect this outer barrier of protection and even remove it from the skin.

Keratogenic Agents: Tar, petroleum, solid hydrocarbons, and like compounds can stimulate the keratin forming cells to a degree where acne lesions and even tumor growth will occur. They may also provoke excessive pigment formation.

The primary irritants account for about 80% of all occupational dermatitis. The materials exert their effect sometimes within the first 24 hours of employment or it may take many months. These substances are to be distinguished from the sensitizers which account for about 20% of all cases of occupational skin disease.

SENSITIZER: A sensitizer is a material which does not necessarily cause demonstrable skin change on first contact, but effects such specific changes in the body or skin that, after 5–7 days or more, further contact with the same or chemically similar compound will cause a dermatitis. This is known as the allergic type of eruption.

Sensitizers do not attack the skin in the same manner as do the primary irritants. Such a dermatitis usually occurs after the fifth day of employment. The dermatitis which results from sensitizers or primary irritants, however, may be indistinguishable. It is usually diagnosed by the history as to the material handled, the time of onset, and results of

patch testing. Of importance is the fact that only a few will usually show the effect of handling a sensitizer in any plant, whereas many who contact a primary irritant will became affected.

There are thousands of known sensitizers, too numerous to list because there is probably no one chemical in industry to which some individual may not become sensitized. Such a list would include materials from every known occupational exposure.

Mechanical Causes of Dermatitis

Mechanical causes of occupational dermatitis include pressure of frictional contacts which can lead to calluses and tumors. Abrasions and lacerations can become infected and lead to disabling skin disease. Certain pre-existing diseases of the skin can be made worse by mechanical irritation.

Physical Causes of Dermatitis

Heat, cold, X-ray, radium, ultraviolet are the more important physical factors which may produce a dermatitis. Occupations entailing exposure to extreme heat may cause severe burns, will increase perspiration which in excess will irritate the skin and may assist the action of a chemical. In addition, heat of itself can produce changes of the blood vessels of the skin. Extreme exposure to cold will often produce frost bite and can also cause serious damage to blood vessels. X-ray and radium are well known producers of cancer in those who exceed the exposure limits. Atomic energy work and the use of radio-active materials will necessitate vigilant control, for radium has long been known to affect workers with not only skin cancer but with serious damage to the blood forming organs. X-ray is mostly used by physicians, dentists and technicians. However, industrial usage of X-ray further magnifies the number who will possibly be exposed to the burning and carcinogenic action of the rays. Ultraviolet rays of sunlight affect the skin of outdoor workers such as farmers and seamen. Severe sunburn, hives, herpes, and skin cancer can result from excessive exposure to sunlight.

Biologic Causes of Dermatitis

Many workers are exposed to bacteria and fungi which of themselves are capable of producing disease. Farmers, tanners, laboratory workers, meat handlers, florists, morticians, fishermen, and many others who contact infectious sources not uncommonly develop cutaneous and sometimes systemic disease from their occupational exposures. Such diseases as anthrax, brucellosis, glanders, actinomycosis, tuberculosis, and erysipeloid are among the many which can occur.

Besides the above classification, another group of agents, plants, are gaining prominence as producers of occupational dermatitis. Poison ivy, oak and sumac account for large numbers of affected individuals among the farmers, linemen, highway construction workers, and others whose work entails exposure. There are hundreds of plants which can affect the skin but the poisonous strains of ivy, oak and sumac are the more common offenders.

From the above listed causes, it is obvious that workers are confronted with a multitude of agents which can injure the skin and thereby produce an occupational eruption. It is impossible to eliminate primary irritants and sensitizers from industry, but if some control over the predisposing causes can be effected and preventive measures are enforced, less dermatitis will be experienced.

Uncleanliness is the one predisposing factor over which the worker can have definite control. By practicing cleanliness at work, those agents which are the direct causes of occupational dermatitis will not be given opportunity to remain on the skin and produce their effect. It therefore will be recognized that, while there always will be many factors capable of causing occupational dermatoses, a program which enforces proper preventive measures will reduce the number of cases to a minimum.

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SODIUM PEROXIDE REACTION

AT a large paper mill, an employee spilled some sodium peroxide while charging a mixer. When the chemical dropped on the wet floor, it reacted violently and fire quickly spread over the wood slatted platform. Employees at first used a hose stream but this intensified the fire and they finaly smothered it with soda ash. The platforms were damaged by fire and water contaminated bleaching liquor and wet down a motor.

Caution employees on the handling and use of chemicals with inherent fire hazards. Combustibles ignited by sodium peroxide should be smothered with dry sand or soda ash, or by using a dry chemical extinguisher. Water should not be used unless the fire area can be flooded with large quantities from a hose.

FINGERS AMPUTATED

ATTEMPTING to oil or repair electric fans which are still in motion can be just as hazardous as trying to oil moving machinery. An electrician attempted to clean out the fan blower box of a mill, running the fan intermittently. He inserted his hand before the motion had stopped, and his hand was caught. When he was able to pull his hand away, he had lost two fingers.

DOUBLE GUILT

THE repair men were guilty of not remembering to wear safety glasses and the operator was guilty of not leaving the acid sludge pump in proper condition for the repair crew. The operator explained that the pump had been blocked off and water run through it, indicating a hose that could be used to wash pump. One of the employees started to disconnect the hose, which instead of water held acid sludge and air, trapped in the line. Acid sprayed into the faces and arms of the two workmen, causing serious injury.

DRIVER INJURES LEG

EMPLOYEE was delivering some small packages to a customer and was unable to park at their unloading dock due to trailer truck being parked. In order to unload, employee put some packages onto the trailer truck and climbed up on trailer. Trailer truck was connected to dock with a metal dock board which was narrower than the truck. In stepping off of truck, he misjudged distance and one leg slipped down between truck and dock.

Employee should have waited until he could park his truck properly at the dock.

SMASHED FINGERS

AN EMPLOYEE misjudged the distance between chuck jaws and chuck body and attempted to sweep a shaving out of the way. The chuck jaw descended and his finger was smashed. Danger is eliminated when an air hose is used for this job.

OILY CLOTHING

A STATIONARY fireman, while firing a furnace in his plant, had just opened the door and thrown in a shovelful of slack, when a puff of flame came out and ignited his trousers, which were greasy. He sustained second degree burns of the left thigh and leg and the right hand. The severity of the accident was due to his carelessness in wearing grease soaked clothing on a firing job.

WET DECK

A WELDER got to work immediately after the deck had been swabbed, and had not dried. He received a severe electric shock, which kept him off work for more than a month. Welding equipment should be properly grounded and electrode holders adequately insulated. Welders should wear approved protective clothing and, where possible, avoid standing on wet or damp work surfaces.

BELOW-GRADE FLOOR

DURING a recent fire in a manufacturing plant, water collected to a depth of six to twelve inches on a below-grade first floor. Wetdown of paper goods stored directly on the floor was responsible for a large share of $6800 damage that resulted. Below-grade floors should have adequate drainage to carry off water. Store stock subject to water damage on skids at least four inches high.

HARD WAY

FALL FROM HEIGHT

A CONSTRUCTION worker attempted to turn a wheelbarrow on an elevated runway. The barrow upset and the man attempted to right it. He lost his balance and fell four stories. He sustained fatal fractures. Analysis of this accident indicates the necessity for more caution and perhaps extra assistance when performing even the most ordinary tasks when height is involved.

SPRINKLERS SAVE PLANT

A COLLECTION of residue from paint sprayers in a ventilating duct at the plant became ignited causing a fire which spread to the roof before it was extinguished.

Firemen found that the fire in the lower section of the duct had been extinguished by the automatic sprinkler system and, devoting their attention to the roof, they quickly ended all further danger.

Damage was confined chiefly to the roof and roofing, although there was some damage to the exhaust fan and motor.

The loss was held at $600.

WHAT'S THE HURRY?

BECAUSE employees couldn't wait to get home, they jammed into the narrow gate of an air depot, instead of walking out in an orderly manner. A woman was knocked down in the rush and trampled. She was treated for back injuries.

NEGLECTED FIRST AID

MECHANIC had placed a tire on a skid and in so doing ran a sliver of steel into the palm of his hand. He stopped working long enough to remove the sliver himself, but did not take the time to have it properly treated. Four days later, he reported to the hospital with an infected hand, which kept him away from his job for well over a week.

THE INDUSTRIAL Nurse

EDITOR
ROSAMOND J. WEBSTER, R.N., A.M., Ph.D.

Industrial Hygiene Growth

IT IS of value to take stock once in a while. As a matter of experience, it is standard practice in all business concerns. So too, in the field of public health and industrial hygiene, it serves a practical purpose to get an over-all picture of current practices and procedures as an aid to the program of work in a given area or plant. "Public Health Reports," April 15, 1949, a publication of the U. S. Public Health Service, provides such a summary of the work of industrial hygiene agencies. It deals with activities concerned with the maintenance of the health of the country's labor force, especially on the federal and state basis. A total of 58 state and local industrial hygiene units are functioning on a full or limited basis in 44 state health departments, 2 state labor departments, and 8 local health departments. About 400 professional personnel are employed. Of these, 66 per cent are engineers and chemists, 11 per cent sanitarians and inspectors. Physicians make up 10 per cent, nursing consultants 10 per cent, and 3 per cent varied professional and technical personnel. Most of the field work of these professional persons is devoted to routine investigations and evaluations of environmental health hazards and preparation of recommendations for their control. In case of need, these official agencies and their staffs are available for such services as well as in other areas of industrial hygiene. A contact with the chiefs of these services may be of help whenever problems arise. But, as a word of advice to industrial nurses, take no action until your superiors have given their definite consent.

Preventing Colds

WHILE this is not the season for colds, some susceptible individuals are ever fearful of contracting one, irrespective of the outdoor temperature. Because colds have been a serious drain upon individual sufferers, and upon the economy of business as well, many attempts have been made to control and prevent them. Some of these have previously been referred to in these columns. The experimental use of a special vapor under careful controls in a large commercial organization has been reported. The efficacy of this vapor as an agent for sterilizing room air was tested by a determination of the content of bacteria in the air, both before and after spraying, and the absentee and weekly incidence rates for minor respiratory illnesses. Under the conditions indicated, it was not possible to demonstrate any reduction in the number of air-borne bacteria, in the reduction of the absentee rate, nor in the incidence rate for minor respiratory illnesses, which could be attributed to the vapor action. Before recommending any such procedure, the advice should be sought of those who have had broad and carefully controlled experiences under normal working conditions. What looks good in a test tube or on a plate may not turn out to be so effective in the office or the factory.

The Score

A RECOGNIZED leader in medical problems relating to the aged worker has drawn up an interesting balance sheet relating to older workers. On the liability side he notes: (1.) increased frequency of chronic progressive disease; (2.) diminishing muscular strength; (3.) reduced speed of reactions; (4.) greater loss of time following accidents because of slower repair. Counterbalancing these are the assets of (1.) reduced absenteeism; (2.) greater loyalty; (3.) increased skill, reduced accident frequency; (4.) enhanced judgment derived from experience. It has also been noted that older workers are particularly valuable in situations where supervision is minimal. The complaint has been made of fixation and resentment to change to be found among the aging. Another interpretation indicates that personality fixation is more directly due to habit patterns of life rather than to the length of life. Constant repetition of the same

procedure—whether physical or mental—for many years tends to create the habit of rigidity. Shifting workers around occasionally, whenever this is possible and is found to be desirable from a production point of view, may add new zest to the job in hand. Some may show resentment. Still, staffs of industrial medical departments face interesting challenges in dealing with mature and older workers. They are with us in growing numbers. These numbers most likely will increase in the years ahead. Let's get used to the idea.

Sight Conservation

THE national health program in England is leading to many new developments. One relates to the large number of men and women who are applying for eye examinations and the fitting of glasses. The demand for lenses and frames has been so great, that according to some reports, the supply is several months behind requirements. One result has been that many are going to eye-glass counters and fitting themselves with the glasses of their choice, often with ultimate serious effects on vision. The ready-made lenses apparently do not offer myopia and astigmatism corrections. The experience can be duplicated in many parts of this country. It is therefore a welcome sign to note that the Division of Adult Health of the New Jersey State Department of Health, has for the past two years fostered and developed a sight conservation program in industry. Preliminary research indicated that a program of this type required consideration of the following factors: (1.) vision, or the eyes and their functioning; (2.) eye safety; (3.) education; and (4.) illumination, including good lighting and color of working areas. The development of the program will bear watching for the facts that may evolve. At the same time, industrial plant studies may be undertaken wherever a medical department is functioning. Leaving the matter of sight conservation and medical attention to the voluntary efforts of individual workers often leaves much to be desired. One serious accident resulting from poor vision and/or inadequate or improper illumination may in the end cost far more than the overhead involved in a sight conservation program.

Personal Factors

THE President's Conference on Industrial Safety was held in Washington March 23–25, 1949. Twelve hundred delegates, including labor, industry, business, government and community leaders attended. It was pointed out that there are over 2,000,000 job accidents a year in this country, and that this represented a menace to the welfare and economy of the country. They cost employers and workers an estimated 4½ billion dollars annually. Since over 90 per cent of the accidents are estimated to be preventable, a direct challenge is faced by all concerned to reduce this figure materially. Safety, it was contended, is everybody's business. There is no single cause or cure for industrial accidents. There are various safety and engineering measures that are well established and that have been adopted in many plants. But much more remains to be done. One of the major lapses, and quite understandably so, has been in the area of the human factors involved in accidents. Before job injuries can be reduced to a minimum, each worker must be educated and trained to make his behavior reasonably safe at all times. It was recommended that more study should be devoted to the personal or human factors in accident causation in order to establish satisfactory and dependable methods of training and control, and to give greater care to physical, mental and emotional differences between individuals in the selection and placement of workers. This is a big order. The same approach has been pointed out many times. All concerned must learn to think in these terms.

Getting Results

SOME who are not well informed as to the definite results of educational measures in relation to disease may deflect interest in further progress. Industrial nurses are in an excellent status insofar as educational efforts are concerned. But the doubters, be they nurses, or administrators, or plant superintendents, may occasionally have to be reminded of the achievements of educational efforts in the field of health conservation. To have the answers readily available, to be able to cite the established facts may refute the arguments of workers or foremen or others. Sometimes even a professional person who should know better falls into the same error of underrating the achievements of preventive medicine and health education. For instance, the statement has been made that "attempts at preventive medicine are being made in a sort of vacuum—hence their ill-success." Well, let us quickly review the facts. The virtual disappearance of leprosy, typhus, malaria, plague, cholera; the considerable diminution on smallpox, typhoid, scurvy, rickets, diphtheria and tuberculosis; the progress that has been achieved in dealing with the venereal diseases; the marked decline in mortality rates, especially among the younger age groups—these are all evidences that health education has paid excellent dividends. But, of course, much more remains to be done, especially among those of upper age groups. It is among these that industrial nurses continue to face a challenge as do all branches of medicine.

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FIRST AID, MEDICAL & HEALTH EQUIPMENT & SUPPLIES

G. S. Magnetic Probe 1

General Scientific Equipment Co.—One-page bulletin introduces the G. S. Magnetic Probe, an instrument adapted to many industrial, first aid and domestic uses. Bulletin shows that the G. S. Magnetic Probe is useful in removing magnetic particles from the operating area of electrical instruments; for removing sharp iron objects from storage bins; and to retrieve magnetic items from sweepings, holes, etc. The probe also removes steel splinters from the eye & skin. The adjustable magnetic strength feature makes it possible for medical personnel to orient the splinter for extraction without painful rupture of the tissues.

M. S. A. First Aid Equipment 2

Mine Safety Appliances Co.—New, 4-page booklet, No. FA-103, describes M. S. A. First Aid & Contest Equipment. Items covered include: the M. S. A. Contest Outfit, a completely equipped unit for first aid training and contests; the M. S. A. Emergency First Aid Outfit, a compact unit for storage at the mine working face; the M. S. A. Standard Stretcher Outfit and the M. S. A. Industrial First Aid Cabinet. Contents of all units are shown. A list of M. S. A. Pocket First Aid Packets is also included.

Comfortable, Cool Cellulose Sweatbands 3

American Alluafe Co.—Well-illustrated, new 6-page folder describes DRYBROW, an improved sweatband made of special cellulose sponge which is strong and durable. Booklet shows how DRYBROW Sweatbands prevent accidents, step up production, give longer service, give sanitary protection and keep workers comfortable during warm weather. Illustrations show how to clean and maintain these sweatbands.

PERSONAL PROTECTION

Headrest Goggles for Welding, Cutting & Brazing 4

Jackson Products Co.—One-page data sheet gives complete information on JACKSON Headrest Goggles for use in gas welding, cutting and brazing operations. Booklet points out that the JACKSON Headrest Goggle is light and easy to wear; simple to adjust; and easy to raise and lower. Helpful information is given about the lenses, eyecups, goggle assembly and the headrest. Also described are: Headrest Goggles for chipping and grinding operations; Headrest Spectacles for light welding, cutting and brazing operations; and the JACKSON Eye & Face Shield for metal finishing; metal pouring; spot, gun, and flash welding; and woodworking operations.

New, Improved Goggles, Spectacles & Helmets 5

American Industrial Safety Equipment Co.—Well illustrated, new 36-page catalog describes the many new and improved goggles, spectacles, helmets, face shields, lenses, plates and other items in the EYE-GARD and BODY-GARD lines of protective equipment. Each page of this catalog is set up so that the user can easily identify the application of each product; recognize construction details, and select the right product to meet his exact requirement.

Rubber & Coated Fabric Protective Clothing 6

M. L. Snyder & Son—Eight-page folder describes and illustrates complete line of protective clothing for industrial use. Described are: acid gloves and mittens; Neoprene-coated cotton gloves; electrician's rubber gloves; leather protectors for linemen's gloves; asbestos gloves and mittens; oiled aprons; special heavy rubber acid aprons; plastic aprons; and various styles of split-leg aprons. A complete line of rubber footwear is also described. Included are: rubber boots, bootees, overshoes, rubbers, waders, leggings and kneeling pads. Rubber, coated and oiled fabric suits, sleeves and hats are shown.

Fire & Acid Resistant Clothing 7

N. Y. Accessories Supply Corp.—New, 10-page booklet presents a test report on NYASCO Fire and Acid Resistant Cloth. Results of the following tests are shown: Acid Resistance, Water Absorption, Flammability, Flexing, Porosity, Dry Cleaning Shrinkage, Water Shrinkage, Abrasion and Tear Resistance. Booklet describes the many types of clothing, including aprons, overalls, pants, shirts, coveralls and laboratory coats, which are made from the NYASCO cloth.

Rubber, Latex & Neoprene Gloves 8

Willson Rubber Co.—Well illustrated, 4-page bulletin describes the WILSON line of industrial gloves and finger cots. A useful chart gives a list of acids, solvents, oils, etc., and shows which of the rubber, latex or neoprene gloves is best suited to give protection against a particular hazard. Complete details are given for each glove in the WILLSON line.

Protective Work Gloves 9

Edmont Manufacturing Co.—New, 12-page pocket catalog describes rubber, plastic and NEOX coated work gloves for industrial uses. Glove styles described and illustrated include: knit-wrist, gauntlet, and safety cuff; having coated palms only or coated palms and backs. Helpful chart aids in the selection of the glove best suited to specific work conditions.

FOOT PROTECTION

Leather Safety Shoes 10

Harry J. Wolf Shoe Co.—Catalog # 22, a 4-page bulletin, presents the WOLF line of Safety Shoes for industrial workers. Seven styles are described thoroughly. The WOLF Molder's Shoe, with composition or chrome leather sole, is featured. Six-Inch Safety Shoes, available in composition, RAW CORD, or oak leather soles; and 8-Inch Safety Shoes, with heavy composition or double leather soles, are described. Construction details are presented.

Soles for Safety Shoes 11

Gro-Cord Rubber Co.—Three informative booklets describe the features and uses for NEO-CORD, GRO-CORD, and GRO-CORK industrial shoe soles. Booklets point out many of the specific working conditions for which each sole is best suited. The information presented in these booklets will help supervisory personnel select the correct sole for each particular plant operation and hazard.

LINEMEN'S SAFETY EQUIPMENT

Linemen's Split & Molded Type Blankets 12

The Surety Rubber Co.—New, one-page data sheet gives complete information on the new, improved SURETY Split Blanket for primary lines, secondary lines, dead ends, etc. Bulletin points out that the slot to center blanket is guaranteed for acceptance test of 25,000 volts. Illustrations show many typical applications of the SURETY Split Blanket. Construction details are described thoroughly.

LADDERS & SCAFFOLDING

Approved Ladders for Industrial Use .. 13

Patent Scaffolding Co.—Interesting, new 4-page booklet presents GOLD MEDAL Ladders and Scaffolding for industrial uses. Booklet states that GOLD MEDAL Sectional Extension, Single, Platform and Step Ladders, and Extension Trestles have been inspected and approved by Underwriters' Laboratories, Inc. Complete information about sizes, construction of rungs and side rails, hardware specifications, etc. is given. Ladder accessories, including ladder shoes, spikes and spur wheels are also described.

FLOOR MAINTENANCE EQUIPMENT

Oil & Grease Absorbing Compounds .. 14

Eagle-Picher Co.—Interesting, new 4-page bulletin introduces EAGLE-PICHER Industrial FLOOR-DRY, a different, highly effective compound for absorbing oil, grease and other liquids. Booklet states that FLOOR-DRY is a granular compound, neither clay or Fuller's earth, possessing high absorptive properties for oil, grease, kerosene, water and other liquids that drop to the floor in industrial operations. Illustrations show methods of applying FLOOR-DRY and give many suggested applications for this new product.

EMERGENCY LIGHTING EQUIPMENT

Automatic Emergency Fluorescent Lighting Systems 15

Lamplighter Corp. of America—New, 4-page booklet describes and illustrates the LAMPLIGHTER Automatic Emergency Fluorescent Floodlight. Bulletin points out that the LAMPLIGHTER Model M-600 was designed specifically as an emergency safety floodlight. When the usual current supply fails, this self-contained emergency light automatically floods the area with light from its own power. Two models of the LAMPLIGHTER M-600, the portable and permanent installation types, are described thoroughly. Bulletin states that these units are built to comply with state fire codes governing emergency lighting units; and that all electrical line components are listed and approved by Underwriters' Laboratories, Inc.

INDUSTRIAL PAINTING

Engineering Painting for Your Plant ... 16

U. S. Gutta Percha Paint Co.—"Engineered Painting," a 25-page booklet shows how planned painting can bring greater efficiency to your plant; and, at the same time, save money for you. Some of the many interesting subjects covered are: Why Are You Painting?; What Color for the Ceilings?; What Color for the Walls?; White vs. Color; There's Safety in Color!; Safety at the Machine; Safety Through Piping Identification; and Production Benefits from Good Lighting. Four-color illustrations and drawings will give you many useful ideas in planning your next plant painting and renovating program.

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July, 1949

NEW PRODUCTS

For illustrated descriptive literature of products listed in this section readers may apply

TO SERVICE DEPT., SAFETY ENGINEERING MAGAZINE

FINNELL MOP TRUCK

RECESSED double disk wheels and a width of only 18½ inches, make the New Finnell Mop Truck easy to store and manipulate in small areas. It carries two tanks galvanized with a capacity of 28 gallons each. A galvanized iron mop shield is placed beneath the three-inch steel rollers, to prevent the mop from getting into the dirty water.

Corners are rounded and the whole tank is constructed of extra durable stainless or galvanized iron. The truck has two swivel wheels and all wheels are tired with heavy rubber. For more details about this new streamlined mop truck which is manufactured by the Finnell System, Inc. of Indiana please send in the coupon.

NEW QUICK AID EXTINGUISHER

A NEW dry chemical extinguisher incorporating what are believed to be three outstanding improvements over models now on the market is announced by The General Detroit Corp. and its west coast affiliate, The General Pacific Corp. The improvements claimed first, more efficient expulsion of the extinguishing agent; second, light weight; third, unusual compactness.

The extinguishing principle employed by the new extinguisher is the expulsion of a fine white powder onto the blaze. The heat of the fire releases carbon dioxide gas from the powder, and this cools and smothers the blaze. A small carbon dioxide cylinder furnishes the impelling force that delivers the powder in a stream as long as 25 feet to the fire.

In the new General Quick Aid Dry Chemical extinguisher—unlike several now on the market—this carbon dioxide

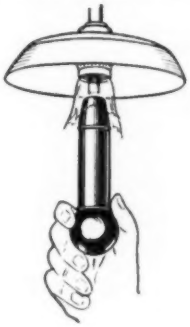
cylinder is contained inside the extinguisher shell, thus providing a more compact appearance. When the extinguisher is used, the operator punctures this cylinder by squeezing a valve mounted on the top of the extinguisher. A second valve attached to a flexible hose from the base of the extinguisher directs and controls the flow of the extinguishing agent.

Because a thin shell of hardened and drawn brass is employed in its manufacture, the extinguisher is said to be unusually light in weight. Higher efficiency is obtained, the manufacturer states, by the use of a special conical bottom funneling the powder directly to the outlet. The manufacturers believe this increased efficiency to be as much as 10%.

The new extinguisher, like all other extinguishers in the General Quick Aid line, is approved by Underwriters' Laboratories.

BROKEN BULB REMOVER

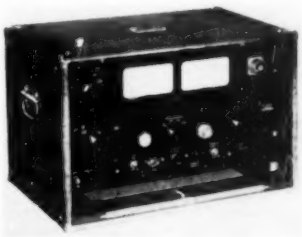
PAINFUL cuts, shocks, short circuits, which are the result of removing a broken light bulb from its socket, can be eliminated by using a new device. This is the broken lamp base remover, manufactured by the Ericson Manufacturing Company of Ohio.



The tool consists of a finished wooden handle, to the top of which is secured a special molded fitting of rubber which engages the inside of the lamp base. To insure absolute safety, no metal is used in the assembly, so it can be used even when the current is turned on. For further details about this practical tool please use the coupon.

INSULATION TESTER

A NEW tester developed by Radio Frequency Laboratories, Inc., measures insulation resistance of power cables, transformers, condensers, switches and wiring assemblies at any desired d.c. voltage up to 10 K.V. Breakdown voltages also can be accurately determined with a minimum of damage due to burning.



Speed in taking measurements is possible because of high current ranges, permitting rapid charging of capacitors and cables containing capacitance and rapid discharge of capacitance after test.

Safety features include a relay for automatic and rapid removal of dangerous capacitance charges remaining on cables or condensers after test. Relay connects the output terminals through a 50,000 ohm, 100 watt resister when the power is turned off. Please use the coupon.

CHISEL GRIP

THE Safe-Hi Chisel Grip, manufactured by the Rose Manufacturing Company of Colorado, is designed to overcome the two main hazards of chisel work—crushed fingers and flying chisels.

Hand grip is round so that it can be held comfortably. The chisel is attached and held in place by flexible steel bands, tightened with single wing-nut, so that it is easy to attach to any chisel up to one inch in size. Weighing only five ounces, it is not tiring to use, and the work can progress rapidly. For more information please send in the coupon.

C-O-TWO FIRE EXTINGUISHER

THE C-O-Two Fire Equipment Company of New Jersey has just completed development of their newest contribution to modern fire fighting . . . the C-O-Two Dry Chemical Type Fire Extinguisher.

It is a self-contained unit with no extra gadgets protruding or complicated operating instructions.

C-O-Two Dry Chemical is free flowing, no syphon tubes or valves within the cylinder to become clogged or inoperative, special dry chemical formula developed to ensure proper flow . . . discharge hose and nozzle remain empty until fire extinguisher is actuated.

Both 20 pound capacity and 30 pound capacity are engineered for fast, positive action the instant fire strikes.

Approved . . . Underwriters' Laboratories, Inc. rating is B-1, C-1. C-O-Two Dry Chemical is non-conducting, non-corrosive, non-freezing and non-toxic and highly effective on flammable liquid and electrical fires.

On-the-spot recharging with no special tools needed. C-O-Two Dry Chemical for recharging is sold in handy pre-measured 20 and 30 pound sizes as well as in a 50 pound bulk size . . . all sizes packed in durable moisture proof containers.

Complete information and literature, can be obtained by sending in the coupon.

July 1949

To SAFETY ENGINEERING

75 Fulton St., New York 7, N. Y.

For prices and complete details of items mentioned in this month's "What's New in Safety Products," check items that interest you and mail coupon.

- ☐ Finnell Mop Truck
- ☐ Quick Aid Extinguisher
- ☐ Broken Bulb Remover
- ☐ Insulation Tester
- ☐ Chisel Grip
- ☐ C-O-Two Extinguisher
- ☐ Plyglov
- ☐ Salt Tablets
- ☐ Non-Slip Soles
- ☐ Plastiguard Gloves

Firm Name .....

Attention of .....

Position .....

Firm Address .....

City .....

CHEMICALLY RESISTANT GLOVE

A NEW coated cotton work glove which has many advantages over synthetic rubber or other plastic gloves in its chemical resistance properties, has just been put on the market by The Milburn Company of Michigan who has had long experience in the plastic field with their line of plastic clothing known as PLY-GARB.

PLYGLOV, as the new glove has been named, will not crack or peel; does not become slippery when immersed in oil, water or solvents; and is water, acid, caustic and petroleum solvents proof. The manufacturer claims that on comparable jobs, PLYGLOV will outwear 10 pair cotton or 4 pair synthetic rubber gloves. This long wearing quality makes their cost extremely low. They are available in four different styles to meet various working conditions. Fingers of PLY-GLOVS are curved for greater flexibility and comfort to the user.

Only large size, first quality cotton gloves which meet Federal standard specifications for a 10-ounce work glove are used for a base. To this base is added a coating of plastic which is the formula of The Milburn Company.

For literature and prices send in the coupon.

IMPREGNATED SALT TABLETS

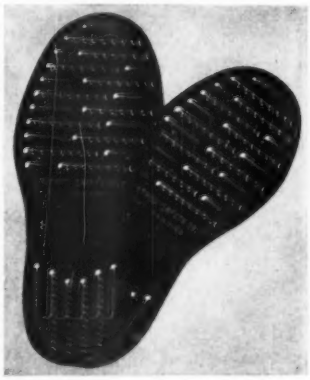
DURING World War II the United States Navy learned that a big percentage of their personnel could not take plain salt tablets or salted drinking water because it caused stomach distress and nausea. The Naval Research Institute at the National Naval Air Center, Bethesda, Maryland, after considerable research and work, developed a new SLOW-DISSOLVING salt tablet which releases some salt immediately after taking, but not enough to cause stomach distress or nausea.

After perfection by the Navy, tablets were subjected to extensive laboratory and field tests and found to meet government specifications in every respect.

The formula developed is now being used by the United States Safety Service Co. of Missouri to produce "Pep-Up" Impregnated Salt Tablets. These tablets are subjected to an exclusive patented process which forms a complete coating around each grain of salt in each tablet. The manufacturer claims that these tablets will also withstand the high temperatures and humidity of tropical climates, as well as the friction and impacts of handling and will not absorb moisture from the air and clog dispensers.

A sturdy container of inexpensive material is used which has a built-in dispensing unit and the entire container can be attached to the wall. When the container is empty it is discarded and replaced with a new full container.

NON-SLIP SOLES



THE latest development for sure footing is the "Penetred" soles you apply yourself that incorporate the principle of the wire claws inserted in the rubber (the same as used on modern truck tires). Made of high class rubber, they can be securely cemented to work shoes by the special cement that comes with each pair of soles. They grip even better as they wear, producing sure footing from the minute they are put on the shoes. Available in two sizes, large and medium in black color, "Penetred" soles are manufactured by Penetred Corporation, Wisconsin. For more information send in the coupon.

BLACK PLASTIC GLOVE

THE new Olympic PLASTIGUARD, the only black plastic glove now on the market is soft and pliable, but durable. Non-slip, large size, curved fingers. Highly resistant to abrasion and to virtually all industrial chemicals, including acids, alkalis, oils, etc. as shown by extensive laboratory tests. It is available with knit wrist, safety cuff and gauntlet.

It also comes in a new reversible style, which the manufacturers claim, may be used on either hand with equal comfort. This style is furnished with a knit wrist. Please use the coupon.

SAFETY ENGINEERING
75 FULTON ST.

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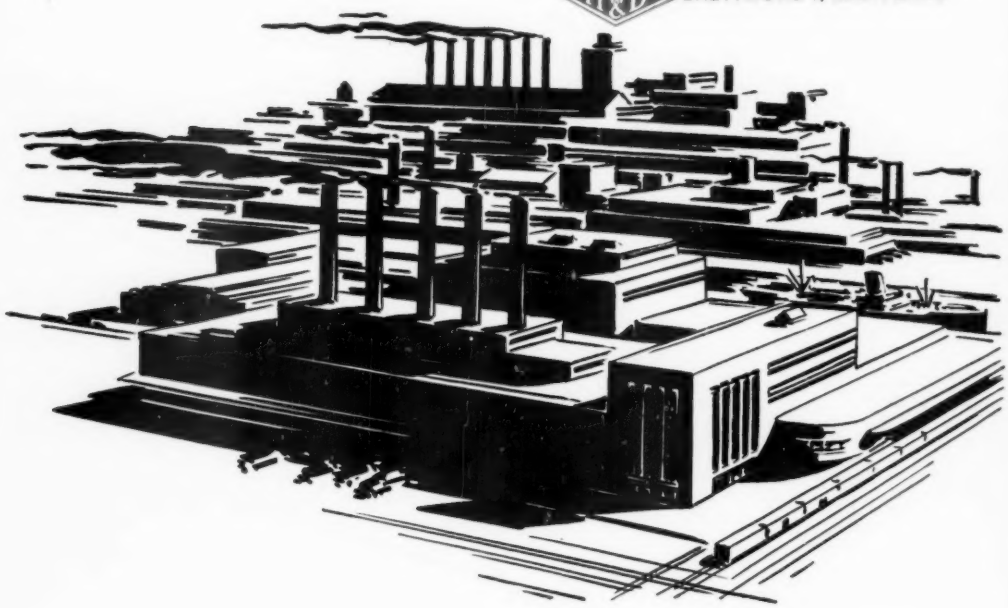
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